STAND BY

STAND BY

By Hugh McAlister

"F-O-Y-N! F-O-Y-N! Stand by—the Arctic calling!"

It was young Lee Renaud asking help of the world. The great gold-seeking dirigible, Nardak, lay wrecked in the frozen North. Hope had been abandoned by most of the crew—but not by Lee.

The early faith that had driven him to experiment with electricity, to read all available material on wireless, to invent and test his own telegraph and then his own radio was still burning within him. Hadn't he brought aid to the Sargon River district during the flood?

Renaud was fighting not only for himself, but for the Nardak's crew. He worked feverishly to mend his little portable radio with bits of broken glass and wire. Frantically and almost hopelessly, he sent his S-O-S, S-O-S, across the uncharted Arctic to the World.

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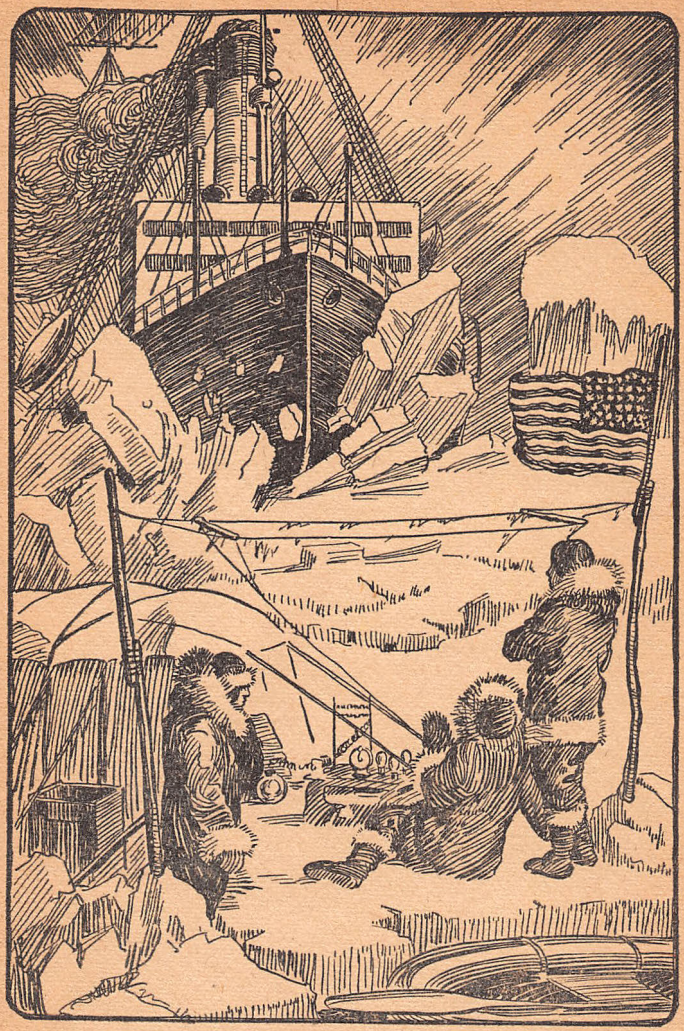

Shoulders squared, head up, young Renaud stood beneath his wireless aerial.

STAND BY

The Story of a Boy's Achievement in Radio

by

HUGH MCALISTER

Author of

"A VIKING OF THE SKY," "FLAMING RIVER"
"STEVE HOLWORTH OF THE OLDHAM WORKS"
"THE FLIGHT OF THE SILVER SHIP"
"CONQUEROR OF THE HIGHROAD"

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Stand By

CHAPTER I

THE CRYSTAL WHEEL

There it stood—a great glass wheel, half submerged in the dusty clutter of an old outhouse filled with broken chairs, moth-eaten strips of carpet, and a tangle of ancient harness. Lee Renaud, spider webs draping his black hair and the dust of ages prickling at his nose, persisted in his efforts to clear this strange mechanism of its weight of junk.

At last it was freed, a three-foot circular sheet of glass mounted on a framework of brass and wood. Held against the wheel by slips of wood were pads of some kind of fur, now worn to a few stray hairs and bits of hide. The circle of glass turned on an axis of wood which passed through its center, and attached to this was a series of cogwheels and a handle for cranking the whole affair—at considerable speed, it appeared.

Lee Renaud backed off a bit as he stared at the thing. Glittering in the dim sunlight

that filtered into the storage shed, it looked strange, almost sinister.

But then the boy had found everything here at King's Cove strange and outlandish. King's Cove! It sounded rather elegant. Instead, it consisted of a handful of shacks that housed a little village of farming and fishing folk, an ignorant people given over to poverty and superstition. King's Cove had been aristocratic in its past. A fringe of rotting, semi-roofless "big houses" up beyond the cove testified to the long-gone past when a settlement of rich folk had set out great orange orchards and camphor groves in that strip of South Alabama that touches the Gulf of Mexico. All had gone well until the historic freeze of 1868 had ruined the tropic fruits and emptied the purses of the settlers. After that, the population steadily drifted away from King's Cove. Squatters came in to fish and to scratch the soil for a living.

Of all the old-timers only Gem Renaud remained. He loved the semi-tropic climate, the great oaks swathed in Spanish moss, the bit of sea that indented his land. He preferred remaining in poverty to moving elsewhere and beginning life over again. So he lived on in a white-columned old house that

year by year got more leaky and more warped.

Then Gem Renaud had slipped and injured his leg. And Lee Renaud had been sent down by his family to look after his Great-uncle Gem.

Lee's home was in Shelton, a pleasant and progressive town. Lee's mother was a widow. Her two older boys were already at work. This vacation, Lee had counted on his first steady job, work at a garage. But because he was not already working and could be spared most easily, the lot had fallen on him to be sent down to King's Cove.

And here at King's Cove the boy felt that he had stepped back into the past a hundred years or more—the queer ignorant villagers; no electricity, only candles and little old kerosene lamps; no automobiles, only wagons drawn by lazy, lanky mules or by slow oxen; homemade boats on the bay and bayou; Uncle Gem's great tumble-down old house where Pompey, the negro that cooked for him, lighted homemade candles in silver candlesticks and served meager meals of corn pone and peas in china that had come from France three-quarters of a century ago.

When Lee went down to the shack of a

country store for meal or kerosene, the village loafers looked "offishly" at the tall boy with close-clipped black hair, knickers, and sport cap usually swinging in his hand. Lem Hicks, the storekeeper's boy, Tony Zita, one of the fishing folk, and other lanky youths, barefooted and in faded overalls, seemed to have no particular interest in life save to lounge on boxes in front of the store and spit tobacco juice into the dust. Sometimes when Lee passed the line of loafers, he caught remarks muttered behind his back—"Stuck-up! Thinks he's citified, ain't he!" Once when Lee got home, he found mud spattered on his "store-bought" clothes—and he hadn't remembered stepping in a puddle either!

Uncle Gem was a queer figure himself. The tall, stooped old man with his sideburns, his chin-whiskers, his long-tailed coat of faded plum color, was a prisoner of his chair now.

As Lee, all dusty and cobwebby, burst in from the storage room, his questions about the strange crystal wheel woke a gleam of excitement in the old man's eyes.

"The glass wheel—you never saw anything like it before, eh?" Uncle Gem's long fingers tapped the chair arm. "Gadzooks! That

was our old-time 'lightning maker.' My brothers and I had a tutor, one Master Lloyd, a Welshman, and a very conscientious, thorough little man. He used this mechanism to prove to us boys that electricity, or 'lightning power,' as he dubbed it, could be tapped by mankind."

"And did he—could he?"

Great-uncle Gem nodded emphatically.

Lee Renaud's own black eyes lighted with excitement, too. Electricity! Why, he was so used to it that he had always just taken it for granted—electricity for lights, cars, telephones. And yet here was a man in whose childhood it had been a mere theory, a something to be gingerly toyed with.

But that old wheel must hold power—or rather man's groping after power.

"Wonder if I could make electricity with it?" Lee was thinking aloud.

"Umph, of course, if there's enough left of the old mechanism to hitch it up right. I could show you—ouch! Confound that leg!" In his interest in electricity, the old man had forgotten his injury and had tried to put his foot to the floor.

"Wait, wait, Uncle Gem! Pompey and I can carry you, chair and all."

The darky and Lee finally did achieve getting Mr. Renaud down the steps and out to the dusty, cluttered storehouse. Then Pompey departed for his kitchen, muttering under his breath, "Glad to get away. Pomp don't mix in with no glass wheel and trying to conjure lightning down out of the sky."

"Pomp's not very progressive," old Gem Renaud smiled wryly. "Lots of other folks around here too that are superstitious about this business of trying to get electricity out of the air with a piece of glass."

For the rest of that day and for other days to come, the work of renovating the strange old wheel went forward. There was more to be done than one might think for, and so little with which to do the repairing. Propped in his chair, old Gem directed, and Lee, scraping up such crude material as he could in the cast-off junk about the place, tried to carry out his orders.

A brass tube, set in a standard of glass and branching forward so that its two arms nearly touched the crystal plate, had once been set with rows of sharp wires like the teeth of a comb. Most of these were missing now, and Lee spent the better part of one day resetting the empty sockets with metal points

patiently hacked from a bit of old barbed wire fencing.

Next, the moth-eaten pads of fur must be replaced.

"Glass and fur," puzzled Lee. "That's a strange combination."

Gem Renaud tugged at his chin-whisker while his mind went searching back into the past. "That book of science, we studied as boys, explains it, if I can just remember. It was something about 'a portion of fair glass well rubbed with silk or fur or leather begets this electrica.' "

"Why, there seem to be all kinds of rubbers or exciters. I reckon though, since fur was used on this contraption at first, fur is what we better use again." Lee Renaud got up and stretched his legs, then went outside.

He had remembered seeing some squirrel skins tacked to old Pomp's cabin door. And now he was going forth to do some bargaining.

"Hey, Pompey," the boy held out his best silk necktie, "how about trading me those skins for this?"

The bright silk was most beguiling. The negro hesitated a moment, then capitulated.

"Yas, sir, I'd sho like to swap. I—I reckon

I might's well trade. You take along them skins, but please, sir, don't connect me in no way with any glass wheel conjuring you might be using those squirrel pelts for."

Restraining his laughter, Lee solemnly agreed and soon departed, carrying four good pelts with him. He cut out good-sized pieces of the fur and nailed these on the four blocks of wood that had held the original fur pads. Then he fixed the blocks back in their places on the frame so that the revolving glass would brush between the two pairs of pads, one pair at the top, and one pair at the bottom.

Cogwheels had to be geared up and a new handle made to replace the old one that had rotted. It was dusk of day before Lee Renaud was ready to test out the ancient "lightning maker." Great-uncle Gem sat erect and eager in his chair. Pompey stood in a far corner, holding a candle for light, rolling his eyes in something of a fright, but sticking by to see after Marse Gem, no matter what happened.

Lee's heart half smothered him with its excited pounding.

Creak of rusty cogs, whirl of the wheel, fast, faster!

All in a tremble, young Renaud brought his knuckle near to the row of metal points set so close to the revolving disc. His hand was still a space from the metal when with a sharp crackle a spark leaped across.

He had done it! He was making electricity —like those old experimenters! Lee burst into a wild shout.

With a sudden booming detonation, a gunshot roared across the little room, dwarfing every other sound. So close it was that Lee Renaud felt a bullet almost scorch across his face, and heard it thud viciously against a wall. Pomp's candle clattered to the floor, went out. There came a sound as though Great-uncle Gem had slumped across his chair.

Outside, stealthy footsteps made off into the darkness.

CHAPTER II

STRANGE EXPERIMENTS

The shot that rang out in the night was echoed by a yell from Lee, who dropped in a huddle beside the glass wheel. For a moment he crouched there, fighting against a wild desire to crawl back under the clutter of rubbish, and hide. What did it all mean? In the dark silence beyond the open window, what manner of fiend was waiting to shoot down innocent people?

But a muttering and moaning and sounds of difficult breathing came to him from other parts of the room. Uncle Gem, old Pomp, both of them might be wounded, dying! He couldn't crouch here like a craven and leave them to their fate. Lee forced himself to action. He began to crawl across the room to where he knew there were some matches and a candle. Fumbling around in the dark, he at last got the candle lighted, stood up and looked about him.

Pompey, face downwards upon the floor, was moaning loudly, "Lordy, Lordy, the lightning of the air done struck us, like I knowed it would—"

"Lightning nothing! Don't you know a gunshot when you hear one?" burst from Lee. "If you're not hurt yourself, come help me quick with Uncle Gem—he looks like he's dead!"

"Oh, Marse Gem, is you kilt?" Pomp, who had suffered no injury save fright, rolled to his feet and came on the run, his kindly old black face all distorted with grief.

Indeed Gem Renaud did look like one dead. He hung slumped sideways, half fallen out of his chair. His drawn face was ashen, his hands limp and cold.

But, though Lee searched frantically, he could find no sign of gunshot wound or oozing blood. Together he and Pompey laid the long figure out at ease on the floor, sponged the face with a wet handkerchief, and rubbed hands and wrists. At last old Gem Renaud opened his eyelids with a slow, tired movement. Then he motioned Lee to prop him up into sitting position.

"Just fainted—heart not so good! This shooting—must have been that old fool,

Johnny Poolak—taking another shot at the glass wheel—"

"Sh-shooting at the wheel?" stammered Lee. "What for?"

"What for? For superstition mostly," old Gem Renaud's black eyes snapped angrily, "and some for meanness, too!"

As Great-uncle Gem regained his strength, he told about this Poolak, the half-wit, full of fool religions and imbued with all the superstitions that ignorant people hold to. The rest of the uneducated squatters here in the village were about on this level too. Once, long ago, when Renaud had been experimenting with his crude electrical devices, a cyclone swept the fringes of the town. Immediately the ignorant villagers coupled the crystal wheel with the disaster, and Poolak, bent on destroying the source of evil, took a shot at the "lightning maker."

"Evidently," went on Gem Renaud, "old Poolak has noted your work out here and thinks you're all set to bring on another cyclone and so has taken another shot at the contraption. If you'll dig out the bullet that's imbedded in the wall beyond our wheel of glass, I'll wager that you'll find it's a silver bullet. Silver is the only weapon to down

witchcraft according to all the old superstitions, you know."

That night, before he went to bed, Lee slipped down to the old storage room. There, by the light of a candle, he pried with his knife blade into the wall just beyond the crystal wheel. And sure enough, the bullet that he dug out was not made of lead, but of silver. A rough lump that old Poolak must have molded for himself, melting down a hard-earned twenty-five cent piece, most likely! The silver bullet on his palm gave Lee Renaud a queer sensation, a feeling that he had stepped very far back into a past peopled with eerie fears and superstitions.

The next day Lee moved the whole apparatus of the glass wheel into an unused room on the second floor of the dwelling house. It was safer up there. A fellow didn't have it hanging over his head that a pious old ignoramus was liable to shoot up one's affairs again with silver bullets.

The wheel, with its wooden base and brass tubes, was heavy, so Lee carried it over piecemeal. This taking it apart and putting it back together again gave young Renaud a much better knowledge of it than he had had heretofore. There was the hollow brass

prime conductor, supported on its glass standard and so fixed on its frame that the metal points set on the ends of its curved out-branching arms nearly touched the glass plate. Lee knew that in some way the metal points collected the electricity generated on the glass whirl of the plate and conveyed this electricity to the hollow brass collector. But there was something else he needed to know.

"Uncle Gem," he questioned, "why is a little chain hung from the fur cushions so as to just dangle down against the floor—what's it good for?"

"Gadzooks, boy! You can ask more questions in a minute than I can answer in a year." Great-uncle Gem tugged at his militant chin-whisker. "Wish I could lay hands on Master Lloyd's old schoolbook on the sciences. It explains lots. Let me see, though, it goes something like this. By the friction of the whirling glass plate against the fur cushions, electricity is developed—the glass plate becomes positively electrified, and the cushions negatively—"

"Positive, negative — positive, negative," muttered Lee Renaud, shaking his head as if he didn't quite take it all in.

"Be quiet, sir!" ordered Uncle Gem testily.

"Now that I've started remembering this blamed thing, I want to finish my say. Without the chains, the cushions are insulated, and the quantity of electricity which they generate is limited, consisting merely of that which the cushions themselves contain. We conquer this by making the cushions communicate with the ground, the great reservoir of electricity. To do this, we merely lay a chain attached to the cushions on the floor or table. After this connection is made, and the wheel is turned again, much more electricity is conveyed to the conductor. Now, young man, do you see?"

"I—I'm much obliged, Uncle Gem. Reckon I took in a little of it." Lee blinked dazedly and off he went, still muttering under his breath, "Positive, negative—positive, negative."

That old science book Uncle Gem was always talking about—if he could only find it, he could learn something. For the rest of the day Lee poked around in the dim and dusty attic high up under the eaves of the big house. Now and again he brought down some volume to submit to Uncle Gem's inspection. But always Gem Renaud shook his head—no, that was not it, not THE BOOK.

Then at last Lee found it, a great calfskin-bound old volume stored away at the bottom of a trunk. Even before he carried it to Uncle Gem, he had a feeling this was the right one. It was so full of strange old illustrations, it was so ponderous—of a truth, it had to be ponderous to live up to its name, "Ye Compleat Knowledge of Philosophy and Sciences."

Gem Renaud's hands shook with excitement as he took hold of the ancient tome that had played so large a part in his long gone childhood training.

"Here's a whole education between two covers. Just listen to the index." Old Renaud began to read, "Astronomy, Catoptrics, Gyroscope, Distance of Planets, Intensity of Sound, Solar Spectrum—"

"And electricity, there's plenty about that too, isn't there?" Lee Renaud couldn't help but break in.

"Yes, yes," Gem Renaud agreed with him absently, and went on flipping through the pages. "How natural they all look, the old illustrations, the waterwheel, undershot and overshot, the waterchain, the turbine engine! It seems just yesterday that Master Lloyd, the Welshman, had us boys all down at the creek building these mechanisms out of canes

and what-not, building them so as they'd really work, to prove to him that we understood what he was trying to teach us."

"And did you build electrical things too?"

"Why, yes. Master Lloyd sent all the way back to New York to get the proper materials for us."

Materials from New York! Lee turned away in disappointment. He had been hoping to experiment some with electricity himself, but what had he out here to work with?

Later in the day Lee picked up the old book again and plunged into its strange, stilted dissertation on electricity. He learned that away back in 1745, von Kleist, a priest in Pomerania, had experimented with a glass jar half full of water, corked, and a long nail driven through the cork to reach down into the water. When the old Pomeranian priest touched this nail head to a frictional machine, he got a "shock" that made him think the jar was full of devils. And that ended experimentation for him. But the next year two Hollanders, professors at Leyden University, carried von Kleist's experiment forward till they developed the Leyden Jar, a practical method for storing electricity.

To Lee Renaud, stumbling upon all this old

knowledge, it seemed that he himself was just discovering electricity. For most of the fifteen years of his life, he had merely accepted electricity as an ordinary, everyday thing. Now the real glory of it smote him, thrilled him, inspired him. He longed desperately to try out these primitive experiments for himself. Here on these pages was given the beginning of man's knowledge of electricity, the beginning of man's struggle to harness this mighty power into usefulness.

If only he could "grow up" with this marvelous power, understand it, step by step! A large order, indeed! Especially for a youngster stuck off in the backwoods.

But anyway, Lee Renaud flung young enthusiasm and will power into this strange task he was setting for himself.

Already he had the crystal wheel that could make a spark, that could generate electricity. But unless that electricity could be "stored," it had no usefulness. So it was up to him to make an electrical condenser. But of what?

Umph, well, those old fellows in the past had gone right ahead and used such things as came to hand—and he was going to do the same thing.

Lee studied the chapter on electricity in "Ye Compleat Knowledge of Philosophy and Sciences" until he could almost say it by heart. Jar of fair glass, brass rod "compleated" with a knob, wooden stopper, sheets of substance tinfoil, chain of brass, three coiled springs—these were the things Lee needed to make the Leyden Jar, which was to be his first forward step in electricity.

Desperately he ransacked the place for "laboratory material" and finally gathered together an old metal door knob, an empty fruit jar, a few links of small chain, some tin cans and bits of wire. It didn't look very scientific—that pile of junk!

But Lee Renaud set his jaw doggedly, and got down to work. Since he had no "substance tinfoil," he figured that perhaps pieces of tin from old tin cans might do. So he slit down a can, and cut it nearly all the way off from its bottom. The round bottom he patiently trimmed till it would just slip in through the neck of the jar. By rolling the tin sides smaller, he managed to push the whole affair down into the jar, where the released roll of the tin sprung itself out to fit neatly against the inside surface of the glass. Then the outside had to be "tinned" and Lee

kept trying until he found a can that was a good tight fit when the jar was pushed down into it.

And there, he had made a start! Instead of tinfoil, the jar was at least covered in tin in the prescribed manner two-thirds of the way up, inside and outside.

Instead of "ye brass rod" that the old book called for, he used a length of wire which he "compleated" with the old brass door knob. He thrust this wire through a wooden stopper he had whittled to fit the mouth of the jar. He had no metal springs, but decided to make the contact with the bit of chain fastened to the end of the wire. When this was thrust down into the jar, the little chain rested on the tin bottom, which was still in part connected with the tin side lining.

Lee Renaud had worked terrifically hard at his job, but now that he stood back to inspect the finished product, it looked more like junk than ever. It didn't seem humanly possible that such a thing could be an adjunct to collecting power, to storing the marvel of electricity.

Half-heartedly Lee held the knob of the jar to the metal points set against the crystal "friction maker." After a few minutes of

this, he grasped the jar in his left hand and experimentally approached his right thumb towards the knob.

There came a scream and a rattle of glass and tin as the jar was flung from Lee's hand to smash into a hundred bits on the floor. The boy leaped high in the air and came down, apparently trying to rub himself in six places at the same time.

CHAPTER III

HOT WIRES

Lee's screech and the crashing clatter of glass and tin brought old Pompey on the run to see what the "devils in the jar" had done now to Marse Lee.

From the next room sounded the pounding of Uncle Gem's cane as he thumped the floor to summon someone to tell him what was happening.

Lee hurried to his uncle, looking rather sheepish, and rubbing his elbow where the "prickles" still tingled.

"No, sir, not hurt; just got kicked a little," he reassured the old man. "That thing I made looked mighty innocent, but it had power to it—more'n I thought for."

Lee Renaud's first experiment lay smashed all over the floor, but he didn't care. He could make another Leyden Jar, for he still had the shaped pieces of tin, the knob, and the rest of the necessities. In spite of the smash,

he was terrifically thrilled—he had tapped power, real power that time! He had learned something important too: electricity was not anything to be played with. It was as dangerous as it was powerful.

With his next Leyden Jar, Lee went forward more carefully. There was a contrivance of his own that he wanted to try out this time, too.

And a very crude contrivance it was—nothing more than a length of wire and two long slivers of a broken window pane.

The boy gave the wire a twist around the outer tin and left one end free. Then he charged the inner tin negatively at the friction machine, and the outer tin (wire and all) positively, at the positive pole of the mechanism.

Next, oh so carefully, gripping the free end of the wire between the two strips of glass—he didn't crave any more shocks like that first one—he brought the wire close, and closer up towards the brass knob.

Before he could ever touch wire to knob—Wow! There it came! Snap, crackle, across the air-gap shot a spark an inch long!

Lee's hands trembled a little as he laid aside his glass pincers. Sure enough, he had done

something this time. That was such lively electricity he had gotten penned up in the glass jar that it couldn't wait for any connecting metallic pathway to be made but had to go leaping across the air-gap.

Power! Power! He was tapping it—and getting a wild excitement out of the job.

It was all true! True! Just like the old book said!

And the musty, ancient volume was full of queer diagrams and elegantly stilted descriptions of other strange experiments. As he turned the pages, Lee Renaud longed to try out more of these things—all of them, if possible.

"Think of it!" Lee muttered admiringly. "That old fellow, Volta, without any friction wheel at all, just piled up some metal and wet cloth and got an electric current! By heck, I want to try that! I want to make a 'Voltaic Pile,' too!"

The makings of the Voltaic Pile sounded simple enough. Just some discs of iron and copper piled up with circles of wet flannel placed in between. Volta had connected his iron discs and his copper discs with two different wires. Next he touched the ends of the two wires together, and—hecla! He

found that electricity began to flow between the copper and the iron.

But when he started out on the hunt for this material, Lee soon ran aground. He got some pieces of iron all right, and as for flannel, a moth-eaten wool shirt in an attic trunk would do for that. But the copper—there seemed to be none anywhere on the whole Renaud place.

Finally old Pompey came to the rescue.

"I don't know nothing 'bout copper, but you might find it down in Marse Sargent's junk pile. He's been dead a long time, but he sho must a throwed away a heap of stuff in his day. Folks been carrying off what-not-and-everything from that junk pile in the gully for years—and there's still yet junk left there smothered down in the weeds and the bushes."

Following Pompey's directions, young Renaud strode along the little woods path that the old darky had pointed out to him. At first he went forward whistling gayly, but after a while the spell of the forest laid its silence upon him. Sometimes the narrow trail wound through the piney woods where a little breeze soughed mournfully in the tree tops and the afternoon sun slanted downwards to cast a weaving of shadows upon the ground.

Then again the little path dipped into close glades of live oak where the long gray moss dripped down from the branches, and where the sunshine could scarce penetrate to dapple the shadows. It was eerie out here in the woods, and silent—no, not exactly silent either. Now and then a bird call drifted on the air. And occasionally there came a slight crackle of brush. Now Lee heard it off to the side of him, now directly behind. Was that a stealthy padding, a footstep—was he being followed?

Time and again the boy whirled around quickly, but never could catch sign of any movement whatever, or of any hulking form lurking back in the shadows.

He was being foolish, that was all. He kept telling himself that it was just the soughing of the pine boughs, the ghostly, shaking curtain of the long moss that had gotten on his nerves. Best thing for him to do was to keep his mind on what he had come for, and wind up his business out here in the woods.

It was all as old Pomp had said. Just beyond the scarred snag of the lightning-blasted pine, a flat-hewn log lay across the gulch for a foot-bridge. Then a "tollable piece" on down the gully, where it wound in close behind what

had once been a rich man's house, Lee found a fascinating tangle of cast-offs partly buried in matted vegetation and drift sand. One wheel and the metal skeleton of what once must have been a dashing barouche, debris of broken china and battered kitchen utensils, rusted springs, a splintered table leg—a little of everything reposed here!

As Lee dug into the tangle of junk and vines, there came again the cautious crackle of a twig. Someone was watching him. He was sure of that. But why—what did it mean?

It was after he had started home that the mystery solved itself somewhat for him. Lee was stepping along in the dusk, rather jubilant over having unearthed an old copper pot. Its lack of bottom didn't matter—all he wanted was copper. And he hoped a bent strip of metal was zinc. Volta had used zinc in another experiment.

Lee strode forward, full of plans of what he was going to try next. Then a tingle of fear knocked plans out of his head as the bushes parted and a hand reached out and grabbed him by the pants leg.

All manner of things flashed through Lee Renaud's mind. Remembering how loungers

at the store had looked their dislike of him, and how Poolak had carried prejudice further and had taken a shot at his friction-wheel experimenting, Lee had full reason to tingle with fear at that clutching hand. Stealthy footsteps had dogged him all up and down these woods, and now he was being dragged off.

The boy stiffened and tightened his grip on the copper pot. He'd put up a fight against whatever was happening to him!

Then as the bushes parted more fully and Lee saw the owner of the clutching hand, he almost dropped the pot in his surprise. A wizen-faced, shock-headed youngster stood before him, one arm uplifted as if to shield his face.

"You—you don't look so turrible," said the child. "I bin following you all evening, and you don't look so harmful. Anyhow, Jimmy Bobb allowed he wanted to set eyes on you, and I come to take you to him—"

"Jimmy Bobb, who's he? What does he want with me?" queried Lee.

"Jimmy's my older brother, only he ain't near so big as me. He had infantile para—para something—"

"Paralysis, was it?" put in Lee

"Yeah, that's what a doctor what saw him one time said it was. But Johnny Poolak, him that preaches when the spell gets on him, said it warn't nothing but tarnation sin what twisted Jimmy all up. I dunno. But Jimmy, he can't move by himself, just got to sit one place all the time. He heard 'em talking 'bout you. He don't never see nothing much and he wanted to see you. But promise you won't conjure up no imps, no nothing and hurt him."

Lee Renaud felt a wave of pity for the bleak existence of the crippled one, though caution stirred in him too. He didn't exactly like to mix in with these Cove people. In every meeting with them, he had sensed their antagonism toward him. If he happened to tread on the toes of their ignorance and superstition, why, like as not they'd fill him full of buckshot! He turned back into the path that led toward home.

"Say, you, ain't you coming?" The child clung to him with desperate, clutching hands. "Jimmy, he's so powerful lonesome. He said to me, 'Mackey, you go git that there furriner and bring him down here. Folks tell how he's got store-bought clothes and slicks his hair and looks different at all. And I ain't never

seen nothing different in all my life.' And I promised Jimmy I'd get you. Please, mister, you—you—"

"I—yes." The child was so insistent that Lee Renaud found himself following down the path. This by-trail twisted in and out through some thickets and suddenly came out before the clean-swept knoll whereon was perched Mackey Bobb's home.

Lee Renaud may have thought he had seen poor folks before, but now he found himself face to face with real poverty. The dwelling was a square log cabin with a log lean-to on behind. Inside was bareness save for a home-made bedstead spread with a faded old quilt and one chair set by the window opening that had no glass but merely closed with a heavy shutter of wooden slabs. Although it was summer, a fire blazed up the mud-and-wattle chimney. Before it knelt a lanky woman in a faded wrapper and a sunbonnet, frying something in a skillet.

Lee had met these Cove women now and then out on the road, as they carried eggs or chickens to the store to barter for store-bought rations. Always they had on wide aprons and sunbonnets. He hadn't known they wore these flapping bonnets in the house too.

The woman rose languidly from her supper cooking and came across the room. She looked worn out and old without being old. Her clothing was awkward and her hands were work-roughened, yet she held to a certain dignity.

"Howdy. I'm right thankful to you for coming," she said. "Jimmy here has been pining for a sight of you. He don't never get to see much."

Then Lee saw Jimmy, the prisoner of the old homemade armchair by the window opening. The boy's limp, twisted legs told why he was a prisoner. The body was undersized, and the face was old with pain, but Jimmy Bobb's dark blue eyes were eager, interesting eyes.

"You, Mackey," ordered the woman, "draw out the bench from the shed room. And now, mister," extending her hand, "lemme rest your hat, and you set and make yourself comfortable."

When he had first stood on the threshold of this house of poverty, Lee Renaud had thought he was going to be embarrassed with people so different from any he had ever known. But here he found genuine courtesy to set him at ease. More than that, the terrible eagerness

in Jimmy Bobb's eyes turned Lee Renaud's thoughts entirely away from Lee Renaud. This Jimmy Bobb knew so little, and he wanted to know so much.

"Is it rightly true," burst from Jimmy before Lee had hardly got settled on the bench, "that you got a whirling glass contraption up at the big house what pulls the lightning right down out of the sky?"

"Well," Lee tugged at his chin in perplexity. How in Kingdom Come was he, who knew so little about electricity, going to explain it to a fellow who knew even less? "Well," Lee made another start, "it's kind of this way. The glass wheel when turned very, very fast between some fur pads, or rubbers, generates a spark of power called electricity. Smart men have proved that this electricity that we generate and the lightning that flashes in the sky are full of the same kind of power. Lightning, you know, shoots through the air in zigzag lines."

"I know. I've watched it often. It goes like this," and the excited listener made sharp, jerky motions with his hand.

"That's it. And the electrical discharge from a man-made battery shoots out jagged, too, like the lightning. Lightning strikes the high-

est pointed objects. Electricity does that too. Lightning sets fire to non-conductors, or rends them in pieces. Lightning destroys animal life when it strikes, and electricity acts just that way—"

"It sounds turrible powerful," muttered Jimmy Bobb. "What and all you going to do with this here power you are getting out of the air?"

"Nothing in particular," said Lee ruefully. "I haven't managed to get any too much of it. But back in the town where I have always lived, there are plenty of folks brainy enough to make electricity do lots of work for them. It makes bright lights and runs telephones and street cars and talking machines—"

"How might a street car look? Tele—telephone, what's that?"

So the eager questioning went. Lee Renaud found himself leaping conversationally from point to point, drawing word-pictures of a host of everyday conveniences that had seemed so commonplace to him but that seemed almost like magic when recounted to this boy who had never seen anything.

In the midst of all this talk, Sarah Ann Bobb, Jimmy's mother, still in the flopping sunbonnet, came forward bearing a tin platter

set with the usual Cove meal of corn pone and fried hog-meat. "Set and eat," she said hospitably.

"I—thank you, ma'am, no—" Lee leaped up in confusion. He hadn't known he was talking so long. Night had dropped down upon him. "Uncle Gem—he'll be worried—doesn't know where I am, or what might have happened to me. I—I reckon I better trot along," Lee stammered, as he reached for his cap that was "resting" where the woman had hung it on a wall peg.

"You, Mackey," said Sarah Ann Bobb with her kind, crude courtesy, "draw out one of these here pine knots from off the fire so you can light him down the path."

As Lee said his hasty good-byes, crippled Jimmy Bobb sat in his prison chair like one dazed.

"Street cars, 'lectric lights, talking contraptions!" he muttered to himself. "If," shutting his eyes tightly, then opening them wide, "if I could only see something myself, oncet, anyway!"

CHAPTER IV

THE GANG TAKES A HAND

For days after that visit, Jimmy Bobb stuck in Lee's mind. The cripple boy had so little. If only there were something one could do to give him a little pleasure!

Then a plan came to Lee. He just believed he'd—well, what he believed was so vague that he couldn't put it into words, but it started him off on a very busy time.

Lee turned back through the pages of the old science book, studying a section here, copying off a diagram there in painstaking pencil lines. In between times he roamed the Renaud place from attic to cellar, from old stable yard to wood lot. And the things he collected—a broken pipestem, a bit of beeswax, some feathers, an old cornstalk, wire, a needle, a few threads raveled from a piece of yellowed silk! A strange assortment for a strong, husky boy to spend his time gathering together! Anybody might have thought

he had gone as batty as old Johnny Poolak. Only there was nobody to see. And as for bothering about making himself ridiculous—um! well, Lee Renaud was so intent upon his task that all thought of self had gone out of his head.

Towards the end of the week, Lee tramped over to the Bobb cabin.

"Good evening, everybody! Tomorrow suppose—" in his excitement, Lee twisted his cap round and round in his hands—"suppose old Pomp and I come here and carry Jimmy, chair and all, over to our place. I've got something to show him. It would be all right, wouldn't it?"

"Would it! O-o-oh! Think of going somewhere!" Jimmy Bobb swayed in his chair. His eyes seemed to get three sizes bigger. "I can, can't I, ma?"

Not being given to over many words, Sarah Ann Bobb merely nodded. But her face was no longer apathetic; some of its tiredness seemed to have gone away.

The next day, though, when Lee and old Pomp parted the bushes on the narrow trail and came out on the bare knoll of the Bobb place, things appeared entirely different. There was a change in atmosphere—due to a

group of rough-looking fellows massed close to the cabin door. Some of those tobacco-spitting loafers Lee had had to navigate around every time he went to the country store! Like all the Cove people, these gangling youths were an unkempt, taciturn lot. Even as Lee and Pomp drew nearer, they gave no greeting, but merely drew closer together like a guard before the door.

Lee Renaud could almost feel the down on his spine prickle as his anger rose against them. What was this gang up to? They had gathered here for something! Must have heard that he and Pomp were going to carry Jimmy over to the electrical shop. Full of the Coveite's ignorances and superstitions, they must have gotten together here to try to interfere with his plans. Well, just let 'em try to stop him—just let 'em! Involuntarily his fists clenched, his jaw tightened. He was going to give Jimmy a good time—as he'd planned! He'd fight 'em all before he'd give up!

Renaud strode forward, with old Pomp edging back a little behind him.

Lem Hicks, who seemed to be leader of the gang, detached himself from his fellows and stepped out into the path.

When the long-armed, hulking Lemuel spoke, what he had to say came nearer knocking the wind out of Lee Renaud than any fist blow might have done.

"We—we allowed we'd carry Jimmy over for you."

Lee stood like one rooted to the ground. He couldn't believe he'd heard aright. There must be some trick in it. This rough gang was up to something.

His fists, that had relaxed, tightened up again. Another was stepping out of the group, the one they called Big Sandy. He was a tall fellow, but he grasped a couple of poles taller than himself.

"Done cut some hickory saplings for to slide under Jimmy's chair for handles, like. Jimmy, he ain't so big, but I allow he'd be quite a tote for just you two. Us four can do it more better—"

"Sure—fine!" Lee Renaud's voice surprised himself. He blurted it out almost before he knew it. But there was a something in the eyes of these boys that made him say what he did. It was that same terrible eagerness—like in Jimmy Bobb's—that hunger after something of interest in their meager lives.

Little dark Tony Zita (one of those low-life fishing folk, old Pomp had once dubbed him) darted up close to Lee, a new light in the black eyes beneath his tousled black locks. "You gonner let us see it all—what you gonner show to Jimmy? We ain't never seen no 'lectricity, nor nothing!"

It was a lively procession that went forward down the little woods trail between the log cabin and the warped and leaking elegance of the old Renaud mansion. Jimmy Bobb, almost hysterical with excitement, rode like a king in the wheelless chariot of his old armchair. Lem and Big Sandy, being the strongest in the bunch, handled a pole end on either side where the weight was heaviest. The Zita boy and Joe Burk put a shoulder to the other ends of the poles. Mackey, who went along too, and Lee took their turns at carrying.

Class feeling had been swept away. The antagonism of these secluded backwoods folk for a "city dude what slicked his hair," the antagonism of an educated fellow toward the narrow, suspicious ignorance of country louts—a new feeling had suddenly taken the place of all this. This group was now just "boys" bound together by an interest.

Up in the littered second-story room that

served as Lee's workshop, young Renaud didn't need to press very strongly his warning against "folks mixing too much with the dangers of electricity." The great glass wheel, with its strange gearing of wood and brass and fur, laid its own spell of warning on the boys. The old thing did look queer and outlandish. One almost expected some black-robed wizard to step out of the past and "make magic" on it.

Well, electricity was a sort of magic, it was so wonderful and powerful, thought Lee, only it wasn't the "black magic" of evil; it was a great power for good.

As Lee cranked the machine into a swift whirl, the other boys stood well back, but looked with all their eyes. Like a showman putting his charges through their stunts, Lee put all his crude, homemade apparatuses through their paces.

"He's doing it! He's ketching lightning, like they said!" whispered Tony Zita as sparks leaped and crackled across the metal points set in brass so close to the wheel.

He showed his Leyden Jar "that you stored electricity in just like pouring molasses in a bucket, then shot it out again on a wire what sparks!"

He exhibited his Voltaic Pile, a crude stack of broken bits of iron and pieces of a copper pot and squares of old flannel wet in salt water that, as Lem Hicks admiringly put it, "without no rubbing together of things—without no nothing doing at all except piling up of wet iron and copper—just went ahead and made this here electricity!"

"Gosh A'mighty," Lem exclaimed, "that's a smart thing! Wish I could fix up something like it oncet!"

Jimmy Bobb didn't have so much to say. He just looked, taking it in and storing it away in his eager hungering brain.

Then Lee opened a wall cupboard and brought out his latest treasures—the things he had prepared especially to show Jimmy Bobb what electricity could do. He came back to the group now, bearing the piece of broken pipestem in his hand. It was a clear, yellowish piece of stem, with a pretty sheen to it. Lee handed it to Jimmy, along with a rag of flannel cloth.

"Rub the yellow stuff with the cloth," he ordered. "Rub hard."

Jimmy's legs might be feeble, but his arms were strong. He put in some sharp, vigorous rubs, his face excited but withal mystified.

He didn't know what it was all about, but he was making a try at it.

"Now that's enough." As he spoke, Lee scattered some downy feathers on the table. "Reach the yellow piece out, somewhere near the feathers," he went on, "and see what'll happen."

Jimmy stretched out the old piece of pipe-stem, and the feathers leaped up to it as though they were alive.

"Well, I'll be blowed!" shouted Jimmy, trying the experiment time and again, and each time having the fluff leap up to cling to the stem. "What is it? What makes it act all alive?"

"Electricity." Lee Renaud picked up the broken stem. "This thing is amber. I just happened to find it in a junk pile. An old book told me about how people found out long ago that 'delectable amber, rubbed with woolen' would generate enough electricity to draw to itself light objects."

"I'll be blowed! Well, I'll be blowed!" Jimmy Bobb kept saying to himself, as he tried the amber and feather stunt over and over. "Just think, I can rub up this here lightning-power myself!"

Lee Renaud was not through with his show

pieces yet. From the cupboard he brought out the strangest little contraption of all. Upon the center of a stout plank about two feet long, he had erected two small posts of wood. The tiny figure of a man, ingeniously cut out of cornstalk pith, sat in a swing of frail silken thread that hung suspended from the tops of the posts. At one end of the board was an insulated standard of brass. At the other end was a brass standard, uninsulated. Lee carefully arranged this curious apparatus so that the insulated stand was connected with the "prime conductor" of the old glass friction-wheel. Against the other standard was laid a little chain so that the chain end touched the floor, thus making what is known electrically as ground contact.

Now the fun began. Electrified by its connection with the prime conductor, the insulated standard drew the tiny figure in the silken swing up against the brass where the figure took on an electrical charge. Then off swung the little man to discharge his load of electricity against the ground contact post at the other end of the board.

This way, that way swung the tiny figure, an animated little cornstalk man that for all the world looked as if he was enjoying his

high riding. Back and forth, back and forth he swung, pulled now by the positive, now by the negative power of that strange thing, electricity. And he continued to swing just as long as electrical power was supplied to him.

Shouts of laughter greeted the antics of Lee's little man.

"This here electricity's fun!"

"Better'n a show!"

"We can come again, huh, can't we?"

Altogether, Lee Renaud had a pleasurable afternoon showing off his treasures. His pride was punctured a bit, though, when, upon leaving, one fellow said, "This here 'lectricity's a right pretty thing. Pity it ain't no use for helping folks."

CHAPTER V

TAPS

"What's this? What's this?" A rough voice from the doorway startled Lee so that he nearly dropped the glass jar half full of salt water, in which he was just placing a strip of tin and a long stick of charcoal.

The man behind the big voice was a little wizened, gray-headed fellow, with twinkle lines around his eyes that rather belied his gruff manner.

"Well, well, well!" boomed the visitor. Lee thought in amazement that he had never heard such a vast bellow proceed out of such a little man. "Um, yes, you must be Lee, Gem's nephew. He told me I'd find you up here. I'm Doctor Pendexter from Tilton, old friend of Gem's. Just now heard about his bum leg and came over to see him. Gem, consarn him, never does write to anybody. Looks like you're getting ready to generate some sort of power. Used to dabble in electrics myself,

I have no time for that nowadays. What's that you're up to?"

"I was just following out the Volta experiments as best I could." Lee touched the jar with its half load of salt water. "Was trying tin and charcoal for electrodes."

"Um! Go on with it." Dr. Pendexter drew up a chair close beside Lee's work table.

At first Lee was embarrassed at having an older head watching over his crude tests. However, as he struggled sturdily on with what he had planned to do, interest in the work claimed his attention till there was no room left for feeling self-conscious.

With a firm twist at each end, Lee proceeded to connect the tops of his two electrodes with a bit of wire. There, he had done it as Volta said. And if Volta were right, there ought to be electricity passing from one of his crude electrodes to the other. He'd test it in his own way. With a quick clip, he cut the wire in the middle, setting the ends apart but very nearly touching. He laid a finger on the gap. A tiny prickling shot through his finger. The thing was working feebly, but working enough to show that the theory was right. Fine—he'd learned another way of making electricity! Then his excitement

quickly faded, leaving him looking rather doleful.

"What's the matter? Didn't it work? It ought to. I've dabbled at that experiment myself. It always works—"

"Yes, sir, it worked. All the old tests I've tackled so far have. But just something to play with is as far as I seem to get. I can't find out how to apply the power, how to make some use out of it."

Dr. Pendexter's quick ear caught the note of tragedy in the boy's voice. To the man came a sudden realization of what a struggle this boy must be having as he strove alone to fathom the almost unfathomable mysteries of electricity. Being a man of action, Pendexter applied a remedy in his own way.

"Consarn it all," he roared, "don't look so blasted blue! You're coming on fine, as far as you've gone." The little Doctor cast a quick eye around the room at the bottles and jars, the Voltaic pile and the crystal wheel with its renovated gear. "The trouble is, you're going sort of one-sided with nothing but one old book to learn out of," and he flipped the calfskin cover of "Ye Compleat Knowledge" with his forefinger. "You've got to the point where you need something modern to study. What

do you know about magnets and magnetism and electromagnets?"

"N-nothing," stammered Lee Renaud in confusion.

"Umph!" from the Doctor. "Well, you've been missing out on one of the biggest things in electricity. The electromagnet, that's the king pin of 'em all!"

"I've seen little magnets, sort of horseshoe-shaped bits of metal that you can pick up a needle or a tack or the like with. Didn't know magnets had anything to do with electricity!"

"You better be knowing it then!" The Doctor banged the table with an emphatic fist. "The electromagnet is the thing that puts the 'go' in telegraphy, the telephone, this radio business. Say, I'm going to send you a book about it, a modern one. You study it!" And with that parting command, the wiry, roaring little man was gone.

Staring at the empty chair drawn up close beside his latest experiment in tin and charcoal, Lee Renaud had the feeling that he had only imagined Dr. William Pendexter. The wizened little man with the outlandish voice was queer enough to have been generated out of a jar by one of these old electrical experiments.

A few days later though, Lee had good proof that Pendexter was very real—and a man of his word, too. When Lee made a trip down to the village store for a can of kerosene, Mr. Hicks, who was postmaster as well as storekeeper, shoved a package over the counter to him and said, "Today's mail day." (Mail came only three times a week to this little backwash village of King's Cove, and then never very much of it.) Mr. Hicks thumped the packet importantly, "This here come for you. Must amount to something, 'cording to the passel of stamps they stuck on to it."

It most certainly did amount to something. When he got off to himself, Lee's hands trembled so that he could hardly tear the wrappings away. Ah, there it was—a big, fat, red-bound volume, with gold letters, "The Amateur Electrician's Handbook."

There was information enough within those red covers to set Lee Renaud off on a brand new set of experiments. From a battery made of a trio of glass jars containing salt water, each jar holding its strips of zinc and copper, and fitted with wiring, he charged a bar of soft iron until it was magnetized—but this would stay magnetized only so long as the

current was put to it. Then he electrified a bit of steel—and it became a permanent magnet.

Lee became more ambitious in his experimenting. He was after power, something that would generate real movement. And so he rushed in where a more experienced hand might have been stalled by the lack of material. But Lee Renaud staunchly refused to be stalled, even though his supply of working material was nothing much beyond bits of tin, iron, some barbed wire, old nails, broken glass, and pieces of brass salvaged from old cartridges.

And out of such junk, Lee proposed to make himself an electric motor!

Well, that was the next step for him. If he were going forward, he just had to make a motor.

His first attempt was the simplest of the simple. According to directions and diagrams in the new red book, he took current from his Voltaic Cell and put it in a circuit through a loop of wire which lay in a strongly magnetized field. The push of power in the lines of magnetic force, through changes in the connections, set the loop to revolving. And there it was, his electric motor! Very sketchy, very

rudimentary indeed, but it worked in its own crude way.

Later, and after much study, he decided to attempt a real little dynamo. This, by comparison with number one, was to be an elaborate affair, comprising a loop of wire revolving between the poles of a horseshoe-shaped permanent magnet, with two half-cylinders connected to the revolving loop of wire and touched at each half-turn by stationary metal brushes. The metal brushing was to turn the alternating current into a direct current. In the making, Lee ran into all sorts of troubles, mostly due to his poor materials. But he kept on, and at last produced something that sputtered and coughed and was as cranky as a one-eyed mule. But it ran part of the time—enough to teach Lee more about electric motors than all the reading in the world could have done.

A few weeks later, Dr. William Pendexter drove his prim little car out again to see how Gem Renaud's leg was progressing—which really wasn't necessary for old Mr. Renaud was coming on finely. He might just as well have admitted that the real reason for driving twenty miles to King's Cove was to see how Lee and electricity were hitting it off.

The wiry little man roamed all over the Renaud place and roared his approval of Lee's cranky, balky dynamo. When he was climbing into his car, he called, "Hi there, Lee! I've got to go to Tilton and back to bring something I want for Gem. Want to go for the ride?"

To Lee, who for months now had been stuck away down in the backwoods Cove, this trip to town seemed to be bringing him into another world, the progressive world that he had slipped out of for a spell. Drug stores, banks, cars, tall poles for telegraph and telephone wires, electric lights—seeing all these again made his dabblings at Voltaic Cells and the crystal wheel seem truly to belong to a long-gone, primitive period.

Pendexter got out at the railroad station, motioning for Lee to follow. He wrote off a telegram, handing it to the operator. All the while Lee stood like one transfixed, staring in fascination at the telegraph instruments on the dispatcher's table. Almost without knowing it, the boy was mentally calculating on the coils of wire, the shining brass. Electricity ran that thing; here was power hitched up and working.

Pendexter jerked a thumb in the boy's di-

rection when he had caught the operator's eye.

"Plumb batty on electricity!" For once the Pendexter roar was silenced to a mere whisper. "Found him down there in the Cove experimenting all by himself. Consarn it, John Akerly, tell him something about electricity! You know plenty. Got to go by the house for a package—be back." And the Doctor disappeared.

Akerly reached out a long finger and suddenly clickety-clicked the instrument. "Want to know something about that?" he queried sharply, but with a grin wrinkling up his leathery face.

"I—what—yes, sir!" The click and the voice had startled Lee.

"Know anything about batteries?"

"I made some that worked—sort of. You mean putting two metal strips in an acid solution so as to produce an electric current. Then a lot of jars with this stuff in 'em, and wired up right—you set 'em together and that forms a battery—"

"You've got it, kid! With that much in your noodle, I reckon I can pass on to you something about this telegraphing business. To begin with, I've got a battery here, with a wire

from one pole of it passing through my table and going all the way to Birmingham. Say that this wire came all the way back from Birmingham and connected with the other pole of my battery, what would that make?"

"An electric circuit," answered Lee. "One that—"

"Yes, one that included the Birmingham station in its circle. Only there isn't any return wire—"

"Then it isn't a cir—" Lee began.

"Yes, it is! Think, boy! This old earth of ours is a mighty good electric conductor—"

"Of course!" Lee was crestfallen that he hadn't thought of that. "I've grounded wires myself, and made the circuit."

"All right then. We've got our wire going to Birmingham, grounded at the Birmingham station, and the earth acting as a return for our current. Now we'll say this circuit is fixed around some instruments on my table, and fixed around the same sort of instruments on the table in Birmingham. Well, when I start tapping my telegraph key—making and breaking the circuit—won't this current be stopped and started at Birmingham just like it is here? Huh?"

"Yes—an instrument on the same circuit."

Lee cocked his head sidewise in deep thought. "It just naturally would be."

"Well, son, that's telegraphy!"

"Telegraphy! Great jumping catfish! Is that all there is to it?"

"Er-r, not exactly," said Akerly dryly. "There's the relay, or local battery circuit, the electromagnet sounder, special stuff and duplex work, signals, the code to be learned." The dispatcher paused a moment in his recital, pulled a battered book out of a drawer, opened it at a page full of queer marks, and added, "Here's the code."

Lee bent over the page. "I see," he said, then added with a wry grin, "or rather I don't see! How do you hitch all those little signs up so that they mean something on an instrument?"

"All right—it's like this. I'll tap the telegraph key for a tenth of a second. That means I've let the current flow for a tenth of a second. We call that a 'dot.' A three-tenths of a second tap makes the 'dash.' Put 'dot,' 'dash,' 'dot' together in all sorts of combinations, and you've got the code. When the fellow at the other end of the line knows the code, he can understand what you're tapping to him."

A couple of hours later when Pendexter breezed back into the office, he found the two of them still at it, with the talk switching back and forth about magnetic rotations and cycles and frequency, about multiplying powers and symmetry and resonance.

"Looks like you two sort of speak the same language," rumbled the Doctor. "Didn't mean to leave you at it all day but got a patient up there. Had to stop—"

"Why, it's—it's late!" Lee looked dazed at the passage of time. "Your work, I didn't mean to keep you from it—" and the boy leaped up.

"I like to talk about electricity. Come again and we'll jaw some more." Lanky, long John Akerly shook hands heartily.

Lee's mind fairly seethed with the information it had tried to absorb about coils and codes and induction and what-not. Electricity was a language that Dr. William Pendexter spoke too, and the twenty miles back to King's Cove fairly slid by.

As they drove up to the high sagging porch of the old Renaud place, the little grizzled Doctor started pulling a wooden box out of the back of his car. Lee put a willing shoulder to it, and involuntarily grunted a little. Just

a little old box—but gosh, it was heavy!

"Not in here," roared the Doctor, as Lee started to ease the thing down in his Great-uncle Gem's room. "Go on upstairs."

Breathing hard, Lee lugged it on, and following directions, slid it down in a corner of his workshop.

"That's right! Good place for it. Some junk I'm going to leave with you," rumbled Pendexter. "Get the lid off."

The next moment Lee Renaud was on his knees beside the box, touching the contents as though they were gold and diamonds. A code book, some tattered pamphlets full of sketches and diagrams, and these well mixed in with coils of copper wire, screws, an old sounder still bearing its precious electromagnets, some scrap glass and brass. It might all have looked like trash to somebody else, but not to Lee Renaud.

Right here under his hand, experimental stuff such as he had never even hoped to buy! He touched one prize, then another.

"It's too much! You don't really mean to leave it?"

"Leaving it! By heck, of course I am. My wife would skin me alive if I brought that box back home to just sit and catch dust and

spider webs again. Never fool with it any more, myself,—no time."

"I—I—how will I ever thank you?" Lee couldn't keep his hands from straying over the old sounder and the bits of real copper wire.

"Do something with it!" roared Pendexter, backing off testily from any further thanks. "Do something with it, that's what!"

CHAPTER VI

AMAZING THINGS

"Just wonder if'n I'll ever get it right! Wisht I'd paid more attenshun to teacher that year we had one!" Lem Hicks ran a tragic hand through his sandy hair till it stood out like a bottle brush.

He sat at the table in Lee's workshop. Before him stood a homemade contraption young Renaud fondly hoped bore enough resemblance to a telegraphic outfit to work. Spread open beside the instrument was the code book, and spread open beside the code book was an old Blue-backed Speller. Lem, with a finger poised above the telegraph key, frantically studied first one book, then the other. It was no use! The excitement of the occasion had driven all the "book larnin'" out of Lem's head. For days he had been planning on this, the first telegraphic message to be sent in King's Cove. But the final effort of "putting words into spelling" and then "putting spell-

ing into code" was too much for him. He just had to tap something, though. Lee, waiting at a similar instrument down in the old storage house, which was the end of their telegraph line, was all set to see if the thing really worked. In desperation Lem clickety-clicked at the only piece of the code he could seem to remember—three quick taps, three long taps, then three quick taps again.

And before he had hardly finished, there came a bang of doors downstairs, a gallop of feet on the stairs, and Lee Renaud shot breathless into the room.

"In trouble? What's the matter?" he yelled. "Short-long-short, three times each, that's S. O. S., the distress signal of the world. I thought this thing must have blown up or busted or electrocuted somebody." Lee dropped limply on a bench.

"Naw," said Lem, flushing shamefacedly. "Every bit of the code 'cept that went clean out of my head. I wanted to get something to you—"

"It got me, all right!" Lee burst out laughing. "But say, man, it worked! We've made us something here. That set of taps clicked through to me as clean as anything. When we get some more code in our heads, we can

really talk to each other over the wire."

Lee Renaud's experimenting with the telegraph set in motion a strange surge for King's Cove, a surge of educational longings. For the first time in their drab lives, some young Coveites "wisht they had sat under a teacher more."

In the past these tow-headed youngsters had looked upon the few months of schooling that occasionally came to them as something to be dodged as manfully as possible. Now with the hunger upon them to enter the grand adventure of sending one's thoughts, clickety-click, far away across a wire, the mistreated reading books and dog-eared spellers were dug out and actually studied. "Great snakes! A fellow railly had to know sump'n if he was goin' to put his thoughts into spellin', and then put spellin' into code," remarked one lank youth as he lolled in front of the village store, and Tony Zita mournfully allowed it was "more worser than tryin' to scramble eggs, then tryin' to unscramble them."

Great-uncle Gem could hobble around now with his stick. He began taking as lively an interest as the youngsters in Lee's "tapping machine." Quite often he would come limping up to sit in the workshop, his black eyes

twinkling beneath bushy white brows at the electrical chatter going on around him.

"Just think," Lee was day-dreaming, "if I had wire enough, I could make my battery send a telegraph signal all the way to Mr. Akerly in Tilton, on to Birmingham, maybe on to my home folks in Shelton—"

"Wait there, wait there! Hold your horses, young man!" Uncle Gem interposed, not wanting this dreamer to dream too big a dream and then have it crash. "Maybe some day you'll progress enough to send far messages by this wireless we read about, but as long as you're still talking about telegraph wires, just remember that it would cost some few thousand dollars just to string wires from here to Tilton—"

"A thousand dollars—um, and some more thousands! Gosh, I didn't know wire cost like that!" Lee's face fell. "I'd been hoping, anyway, that we could stretch a wire on to Jimmy Bobb's so he'd be sort of in touch with folks. He's so—so—"

"From here to the Bobb place is more than half a mile. Half a mile of wire is a considerable bit. Here, give me a pencil; let me do some figuring." Great-uncle Gem bent his head above a scrap of paper. "There's the

horse lot and the cow pasture—we don't have any cattle on the place these days. All that was fenced once, four strands high. You might as well take what you can find of it and put it to some use."

"Hurrah for the famous Renaud-Bobb Telegraph Company!" shouted Lee, leaping up and letting out a whoop like a wild Indian. "Uncle Gem can be president. Who wants to join this mighty organization?"

It seemed that everybody did, or at least all the young crew in King's Cove. Taking stock in this booming concern consisted merely in contributing all the labor and man-power you had in you.

Stringing up even a half mile of telegraph wire turned out to be a vast task; especially since the wire had to be yanked down from old fences, and some of it was barbed, from which the barbs had to be untwisted. But whenever a Cove youth could be spared from hoeing 'taters and corn or pushing the plow, he rushed off to the Renaud place to work ten times harder. Only this new labor was interesting work—work with a zest to it. One crew logged in the woods for tall, strong cedar poles that were to carry the wires, another crew de-barbed old fencing, still another dug

the line of post holes. A great search went on for old bottles to be used as glass insulators.

Then the actual stringing up began to go forward.

"Mind, you boys," warned Uncle Gem, "don't let anybody's clothesline get mixed up in this. We don't want to stir up any hard feeling round here against our project."

Which very likely was the reason why the stringing up halted for a time while more old fencing was de-barbed, and why, in the dark of a night, Nanny Borden's clothes wire miraculously reappeared on its posts.

It was hard for untrained hands to set the posts firm and in a straight line, harder still to string the much-spliced wire taut.

At last, though, the great day came when the Renaud-Bobb Telegraph Line reached from station to station.

The lonely little Bobb cabin suddenly became a center of interest. There was always some youngster happening along who wanted to send a message over the line. Jimmy Bobb's eager mind picked up the code quickly. His long fingers learned to click the key with real speed. The cripple began to know happiness. For the first time in all his starved,

meager years, he was getting in touch with life.

Then one day while Lee Renaud was away from his workshop, a frantic message came clicking over the crude wires.

"That thing's banging like fury up there!" Uncle Gem waved his stick ceilingwards as Lee dashed into the house.

The boy hesitated a moment. He had come for a bag, and was going out to the old junk heap in the gully. Right now something new was surging in his brain and there might be some metal on that old carriage frame that would help him.

The stuttering of the telegraph clicked on again.

"Just some of the gang wanting to gab," Lee muttered, turning away.

Then the insistent note of the click caught his ear.

"That's—that's S. O. S.!"

Up the stairs he leaped, taking two at a time.

Sharp and loud came the tap-tap-tap, three short, three long, three short! S. O. S.! Save! Save! Save! Again three short, three long—a little crashing thump of the key—then blankness.

"What is it? What is it?" pleaded Lee's clicking key.

No answer.

"Something's happened! Can't get any answer from Jimmy!" he shouted as he left the house on the run. "Send Pomp for help to Ray's meadow—"

Great-uncle Gem, for all his injured leg, must have put some speed into his search for Pomp. For, as Lee sped down the woods path, he could hear the old darky somewhere behind him hallooing, "Help! Help!" and clanging the dinner bell as he headed across the village towards the open hay fields where everybody was cutting grass while the weather held.

With that racket Pomp would stir up somebody, never a doubt! But Lee wasn't wasting time waiting on reinforcements. With that last insistent tap-tap call of the telegraph still beating in his ears, he stretched his long legs down the path.

Hurtling through bushes, dodging swishing limbs, he burst panting into the clearing of the Bobb hilltop. Here no human sound greeted him. Instead, the awful crackle of flames filled the air. Whorls of smoke curled up from almost every part of the old shingle

roof. As he looked, the smoke whorls began to burst into tongues of flame.

Lee raced to the door and flung himself inside, shouting, "Jimmy, Jimmy, where are you?"

There was no answer.

The heat and smoke were nearly overpowering. Lee dropped to the floor and crawled across the room. Yes, here by the ticker was Jimmy's chair, and Jimmy in it, slumped in a huddle. Lifting the limp form to his shoulder, Lee staggered back to the door and out into the fresh air.

As he laid Jimmy down in the shelter of the trees on the side off the wind, shouts greeted him. The whole woods seemed alive with people. Pomp and his dinner bell had done their work.

While Lee revived Jimmy Bobb, an impromptu water-line formed. Like magic, buckets and tubs and even gourds of water passed up from the spring under the hill to the flaming hell of the roof. Cove women, not being given to style, wore plenty of clothing. Here and there, a wide apron or a voluminous Balmoral was shed, wetted and wielded as a weapon to beat down the flames. Crews of howling small boys broke pine brush

for brooms and swept out any creeping line of flame that caught from sparks and headed for the fence, the slab-sided chicken house, or the cow shed.

Then it was over. The fire was out. Blackened rafters and a pall of smoke told what a fight it had been. The roof was gone, but the cabin walls stood, and the meager homemade furniture was safe.

Sarah Ann Bobb, stirred for once out of her habitual calm, stood near Jimmy, waving her hands and weeping.

One of the Cove men detached himself from the smoke-stained group and went up to her. "Don't take on so, Miz Bobb," he consoled awkwardly. "Hit war that old no 'count chimney what must 've done it. We aims to build you a new one, and set on another roof. Done plan to start tomorrow, the Lord sparing us!"

"I ain't crying sorrowful." Sarah Ann's knees let her down on the ground. "I'm so happy Jimmy ain't dead!"

"I'm all right, maw," Jimmy assured her, "but I bet the telegraph's all busted."

"Yep, considerably busted, I suppose." Lee sounded inordinately cheerful. "But all the real stuff we need is still here, and we'll be

building her over again, good as new, maybe better."

"Oh," Jimmy Bobb settled back down, "I'm right thankful you saved hit. Hit sho saved me!"

CHAPTER VII

HARNESSING LIGHTNING POWER

"Aiming for to go up to Renaud's?" asked Big Sandy as he fell into step alongside of Lem Hicks.

"Yep! Wanter see how them new fixings up there are going to turn out," was Lem's answer.

"You ain't—you ain't sorter scared?"

"Scared?" Lem wheeled on Big Sandy, then grinned himself as he saw the teasing grin on the other's face.

"Honest Injun, though," went on Big Sandy, "lots of folks round here are scared plumb stiff over this electricity stuff. Old Poolak's had one of his preaching fits. He's been spreading the word that it warn't fire from the chimney what burned Miz Bobb's roof, but lightning fire what our telegraph conjured down out of the sky. According to his tell, it ain't Scriptural to be taking electricity out of the air and hitching it on to

man's contrivances. Johnny allows it's tampering with evil and's goner bring down fire and brimstone on the whole Cove 'less'n folks take axes to our newfangled fixings—"

"Johnny Poolak better mind his own business and not be mixing in with our wires." Lem's chin went out belligerently. "I'm banking turrible strong on this new fixing of Lee's. It's so mysterious-like, it don't seem anyways reasonable. Yet if it works, it'll be the wonderfullest thing what ever happened down here in the Cove."

"Well, I'm for it, strong." Big Sandy flung open the gate to the Renaud yard and went in. Lem followed.

The "new fandangle" that Lee was working on now was an attempt at radio. Telegraphy was wonderful enough. But that took wires, thousands of dollars' worth to reach any distance at all. With radio, one merely sat at a machine, turned a key and picked up sound that went hurtling through the air with only electrical power to bear it on. It seemed unbelievable—yet man was already doing this unbelievable thing. And Lee Renaud, stuck off in the backwoods, had the temerity to make a try at this same wonder.

Lee was subscribing to a magazine now,

"The Radio World." Hard study and the endless copying of hook-up designs from its pages was the way he was preparing ground for his next experiment. By degrees he had gathered together in his old workshop such materials as he could lay hands on. His collection was crude enough to have gotten a laugh out of a regular "radio ham," but it was the best he could do under the circumstances.

True enough, little rip-roaring Dr. Pendexter, out of the kindness of his heart, had wanted to buy Lee considerable experimental stuff. But somehow the boy's pride had rebelled at being under too much obligation to anyone.

"I thank you, but no, sir," he had stammered, "I can't let you give me everything. It would be different if I could only earn money some way to pay for it—"

"There is a way!" snorted the Doctor. "Only I didn't want you fooling away time at it when you could be going forward with electricity. Hell's bells! You've got too much pride!"

The way of money-making that Dr. Pendexter pointed out to Lee was the gathering of wild plants for medicinal purposes. Now

and again the boy sent in little packets of such things as bloodroot, wild ginseng, and bay leaves. Quite a lot of herbs brought in only a few dollars, but that money wisely expended brought back some very wonderful things through the mail. One time it was two pairs of ordinary telephone receivers; another time it was a piece of crystal; again it was a little can of shellac and some special wire. In addition, Lee had gathered together an assortment of his own—a piece of curtain pole, some old curtain rings, a piece of mica that had once acted as "back light" in an ancient buggy top, a length of stout oak board, sundry bits of wire and second-hand screws and nails.

Back in his home town of Shelton, Lee had once listened in at someone else's radio—a sleek affair with all its interior workings neatly housed in a shining wooden case. In those days Lee had never dreamed of aspiring to own a radio, much less aspiring to make one by using an oak board, an old curtain pole and pieces of wire as parts.

Throughout the making, the lanky youths of King's Cove "drapped in" on Lee whenever they could, to see how the work was progressing.

Now, when Big Sandy and Lem hurried along the shady lane in the dusk, and on up to the workshop, they found Tony and little Mackey and Joe Burk already there ahead of them.

"The aerial's done up!" shouted Tony Zita. "Done did it yesterday. Had to finish the job by lantern light."

"I helped!" little Mackey Bobb was fairly bristling with pride. "Us all went up through that funny little door right in the roof of this here house. One end of the wire's hitched to a pole that's lashed onto a chimney. T'other end of the wire is rigged to a scantling what's nailed to the barn."

"And you're countin' on that high-sittin' wire to pick up music out of the air for you?" asked Big Sandy incredulously.

"Jumping catfish, no!" exploded Lee, who was cutting wrapping paper into long strips. "We've got to hitch up a sight of apparatus here in the house, too."

"Ain't there something I can do?" Lem Hicks moved over to the bench where Lee was working.

Soon everybody was hard at it, doing whatever he could on this strange contraption young Renaud was evolving. The younger

boys scraped and trimmed at smoothing off the heavy oak plank that was to be the base of the outfit.

Lee had spread around him on table and bench a half dozen "Radio Worlds," propped open to show diagrams full of coils and lines, and lettered at certain points, A, B, C, D, and so on.

"This paper says the tuning coil is most important, so we better go mighty careful on that." Lee produced a piece of old-fashioned wooden curtain pole, three inches in diameter. "A ten-inch length is all we need."

When this core was measured and cut, Lee began to wind it smoothly in the strips of tough brown wrapping paper that he had already prepared. As he wound it on, Lem, armed with the little can of shellac and a stiff feather for a brush, bent above the job and carefully shellacked each piece.

After the neatly wrapped core with its dose of the sticky gum had dried out a little, the hardest task of all was undertaken—winding on the wire tuning coil itself. The paper strips had been easy to handle, but managing the lively, wriggling wire was a very difficult task.

"Help, everybody! We've got to step lively

to get this thing on right away, while the shellac is still some sticky, so it will hold the wire firm." Lee waved his roll of wire, and there was a general rush for everyone to have a finger in this excitement.

A couple of fellows held the wire taut, and another couple, gripping the ends of the wooden rod with tense fingers, turned it steadily. As the master hand, Lee laid the coils in place at each turn. With even the simple machinery of a lathe and foot pedal, it would have been an easy job to wind the core. But with only excited boyish fingers to grip and turn, the task was one of considerable difficulty. The wire would writhe and knot. Now and again coils slipped and refused to lie smooth.

"Unwind it! Try it again!" Brows bent, mouth set firmly, Lee unwound and rewound, over and over again. This thing had to be right. No use making it if the wire didn't lie smooth and close, without any space at all between the coils.

"Um! That looks sort of like it now!" Lee said with satisfaction as he fastened down the last tag end.

The other boys drew close and gazed upon it pridefully.

"Gosh, it does look right! Slicker'n silk, and 'pears to be real close kin to that there picture in the book," Big Sandy said, holding the illustration of the tuning coil in a "Radio World" up beside their effort in wire and wood. "I thought you was being tollable persnikerty, doing it over so much, but reckon you was right."

"The sliding contacts come next. Wonder if we can mount them now?" In lieu of store-bought metallic contacts, Lee produced a pair of old metal curtain rings. "Got to punch holes in 'em so we can stick in the copper rivets."

And so the work went forward. Night after night the gang met in Lee's workshop. There was a certain amount of the apparatus that even untrained hands could attend to, such as cutting the four-inch squares of paraffined paper and tinfoil, alternating these in a stack, then placing these between two blocks of wood and screwing them tightly together. This was the "condenser" that, according to the printed directions, was to help the electric vibrations pass through the earphone receivers.

Since the human ear alone could not detect the sound waves that touched the aerial, a

sort of electrical ear was necessary. And this electrical ear was nothing more than a piece of sensitive galena crystal and a wire of phosphor bronze. If this thing that Lee Renaud was building turned out right, when that phosphor bronze wire came in contact with the bit of crystal, the mysterious sound wave would become audible.

Lee himself attended to the delicate task of mounting the galena crystal and adjusting the two rods that held the sliding contacts, also the soldering of various "lead in" and "lead out" wires.

Then at last it was all done. For Lee Renaud, this was a crucial time. It didn't seem possible that this homemade contraption of wood and wire and old curtain fixtures could really reach out into the ether and pull down music for its users.

According to one of old Pomp's favorite expressions, the young inventor felt "more nervouser than a rabbit what's bin shot at and missed."

He would have liked to have tried out the thing alone. But there was no chance of that. Every youngster in the Cove was packed in that old upstairs workshop. Even a couple of flop-eared 'possum hounds had managed to

sneak in at their young masters' heels. Here was a full audience and everything set for a great night.

On the heavy oak base on the table before Lee, the tuning coil, the crystal detector, the condenser, and the terminals for the head phone plugs were arranged and fitted in their proper places. The last cutting, stripping and soldering of connecting wires had been attended to.

"G-gosh, I'm almost afraid to give it a try," muttered Lee to himself. "S'pose it don't work!"

He couldn't keep his hand from trembling as he set one of the sliding contacts at the middle of the tuning coil, and moved the other just about opposite.

Young Renaud had on one pair of ear phones. Jimmy Bobb and Lem Hicks, heads right together, shared the other pair.

Lee, all keyed up to hear something, adjusted the sharp little phosphor bronze wire on the detector until the point just touched the crystal. No sound came. Lee could feel the tenseness of the crowd, could sense the gasp of bitter disappointment from Jimmy and Lem. In desperation, he slowly moved the slider along the tuning coil. Suddenly a

burst of orchestra music rolled in to those at the ear phones. Faintly at first, then swelling triumphantly as Lee Renaud slid his contacts along the coil!

Those first listeners sat spellbound till others, eager for their turn, snatched away the ear phones.

Like one in a trance, Jimmy Bobb sat with the music still ringing in his soul.

"Gee," he whispered, "those fiddles, high and sweet, like they was right in the next room!"

"And they were really in Gulf City, fifty miles from here!" laughed young Renaud. "Let's make a try for Madsden. That will be a good bit farther—something like a hundred miles.

Until far into the night the group stayed "tuned in," excitedly swapping phones, eagerly listening to the first real music in their lives.

King's Cove was in touch with the world! It had suddenly come out of the nowhere into the somewhere. A copper rivet slid along a coil of wire, and in a fraction of a second this bunch of boys in faded, ragged overalls was in contact with music in another county, music in another state even!

Then there came a swishing thud against the outside of the house as if made by the recoil of wire.

"S-s-sh!" hissingly whispered little Mackey, who had been peering out of the window. "Something out on the barn roof—like a man with hisself all humped up, creeping, creeping—"

"Somebody's been at our aerial—cut it off!" agonized Lee, realizing to a certainty what that swish of wire against the house had meant.

Another had taken in the situation, too, it seemed. The shutters of the next room were flung open and Great-uncle Gem's voice rang out angrily, "What you up to on that roof? Don't be trespassing on my place, you Johnny Poolak!"

From the slant of the barn roof a fanatical voice croaked back, "Lightning power belongs up in the sky. The Lord's agin humans what steals his lightning. Fire and brimstone! But the wire's cut! And I'm a-saving King's Cove!"

"Better be saving your own hide!" shouted old Gem. And from that second-story window roared a pistol shot.

A thud and a bump from the barn roof.

Then footsteps crashing off, running through the underbrush.

Into the radio room limped Gem Renaud, wiping off a smoking, long-barreled old pistol. "Just shot up in the air," he announced angrily. "But I hope I put enough fright into that old nuisance to run him into the next county."

CHAPTER VIII

COMPRESSED POWER

"How far a piece you goner take it?" questioned Lem Hicks.

"You stay here. I'll amble on down to where the road forks off into the woods. That'll put us more'n a mile apart. This outfit worked all right just from room to room, but we're giving it a real try-out now." Lee Renaud's voice was full of suppressed excitement.

He wore a contraption, the like of which was never seen before. On his head was a cap of straps that held a pair of radio ear phones in place. On his chest hung a small transmitter that could be adjusted to his lips. Slung against his back, all neatly packed into a sort of knapsack, was a mechanism that operated by means of a crankshaft driven by hand. The whole machine was less than twelve inches square, but so geared that when its hand crank was turned at thirty-three revolu-

tions per minute, its generators made thirty-three hundred revolutions per minute. In Lee's pocket was folded a miniature aerial.

Lemuel Hicks wore a similar outfit.

Portable radio—that was something ambitious for a youngster to be tackling!

But Lee Renaud had made many steps forward since that night when he had put King's Cove in touch with the world with his home-made radio. The Cove itself had stepped out a bit in the last months. It had become a place of sharpest contrasts. Though mule and ox carts still creaked down its sandy village road, within its cabins nightly sounded the tinkle of music which radio, that modern of the moderns, plucked from the air of the great outside world. The radios were home-built affairs, some the galena crystal type, some the carborundum type, all patterned after Lee's first attempt—but they got the music, the news, and the latest crop prices. They were waking up the Cove out of its long lethargy.

Over in Tilton, Dr. Pendexter had told a newspaperman of the struggle a lone boy was making to master electricity, and had laughed about the whimsy of radio in that backwash, the Cove.

The reporter knew a good story when he heard one, and wrote up Radio and the Cove —with a strange outcome for Lee Renaud.

That newspaper story was good human-interest news. It was copied by other papers and was read by a far-reaching audience. Then things began to happen.

Touched by the pathos of a boy's lonely struggle, radio fans here, there and elsewhere packed boxes of material and sent them down to Renaud of the Cove. Americans are generous when human interest hits the heart. Books, wires, tubes—Lee Renaud was almost swamped in the wealth of experimental material. And Lee even had a visit from one of the regular relay station inspectors. There was talk of making the Cove a step in the Relay Organization of America and erecting a sending station there. The talk died down, but out of the affair Lee got in touch with American Radio Relay and was given a call number, "RL."

With the thoroughness peculiar to him, Lee made no spectacular plunge, but went ahead step by step. As he had followed the beginnings of electricity up through that ancient scientific book, so he now tried to "grow up" along with the moderns, in radio.

The making of a new type radio transmitter was his dream, but he began his work back at the very beginning. Up in his workshop stood copies of some of the very first radio models. There was a primitive looking Hertz Resonator, or Receiver. It was nothing but a hoop of wire, its circle being broken at one point by a pair of tiny brass balls, with a very small air-gap between. When this resonator was set up across a room, exactly opposite the spark-gap of an electric oscillator, and the key of the oscillator was manipulated, sparks shot across the gap in the wire hoop, even though the hoop was not attached to a current. And that was wireless—the first one! In Lee's collection were also copies of the Branly Coherer and the Morse Inker, and of that amazingly simple radio apparatus with which the inventor Marconi shook the world.

As Marconi had built on the discoveries of Hertz and Lodge and Branly, so Renaud planned to build on Marconi. Where other modern inventors had seen the vision of huge transmitting machines and tremendous power, young Renaud's vision was to ensmall radio.

Months of work had gone into these out-

fits that he and Lem Hicks bore on their backs. There was power in them, but of necessity they were crudely built.

And now would this simple mechanism transmit sound for more than the few yards for which it had been tested thus far? Time and again as he tramped along, Lee was tempted to halt, set up his outfit, and seek connection with Hicks, waiting at the village.

But he had set the forks of the road as his distance, and Lem wouldn't be expecting him before a certain time anyway.

At last he was there, where the rambling country road divided, one branch dropping down into the valley, the other leading over a wooded ridge. It was all a matter of minutes for young Renaud to assemble his outfit, erect the folding aerial above his head, adjust the mouthpiece, and crank the handshaft for power. He was in a tremble as he pressed the buzzer signal and tensely waited for some sign that the sound had gone through.

But no reply came in through the small ear phone receivers. The whole world seemed suddenly still, save for the faint rustle of wind in the leaves, the twit-twit of a bird off in the woods.

"Guess it won't work. It's failed!" Lee's

mind was registering dully when, with a hissing "zip" that made him leap clear of the ground, a distinct buzz sounded in the ear pieces.

"H-hello! You—you hear me? You Lem!" Lee shrieked into the little transmitter.

"Hey! Plain as day! You like to blew my head off!" came the delighted voice of Lem Hicks. "Whoop-la, you done made something, Lee Renaud!"

For a spell the two boys passed excited words back and forth through this thing that had made a mile of space as nothing. Then a sudden beat of hoofs down the woods road made Lee leap back towards the ditch. He had hardly cleared the way when a lank bay horse, lathered in mud and sweat, plunged around the bend.

At the sight of this strange apparition in head-strap and ear pieces, with aerial wire rising above its head like horns, the horse shied, snorting and plunging.

"Hi, be you man or devil?" shouted the mud-spattered rider, trying to rein in his animal. "What for be you rigged up to scare honest folk out of the road?"

"I—just trying an experiment," Lee hastily slipped his head free of aerial harness and

the mouth and ear pieces, so that he looked human once more.

"No time for any of your 'speriments to be hindering me," called the rider over his shoulder, as his horse plunged on down the road. "I'm spreading the call for help. Floods over everything up Sargon Sound! Folks homeless and dying!" and with a clatter of hoofs, he was gone.

He was a surprised rider, though, when he galloped into King's Cove village some ten minutes later and found that his news had preceded him.

Two little portable radio machines, manipulated by a couple of youngsters, had brought the word faster, ten times faster, than his horse could travel and men were already preparing to set out to rescue the flood sufferers.

CHAPTER IX

SARGON SOUND

A line of wagons were unloading along a ridge of land that overlooked the turbid yellow waters of the Sargon flood. One group of men were stacking sacks of meat and meal, which had been lugged over the hill road to help feed the stricken families that had lost everything. Another group had already started for the woods with their saws and axes to fell trees for rafts, on which to bring off the hundreds of refugees huddled on ridges still showing above the water.

"Powerful heavy, and don't feel like nothing to eat," said Jed Prother, giving a disdainful kick against some crates and a pile of metal pieces wrapped in old sacking which he had just lifted off a wagon.

"Hi—don't! That's our radio! Might break something!" protested Renaud, coming on the jump.

"Radio? Huh!" snorted Prother. "Better

have brought meat and blankets 'stead of that thing! No time to tinker at toys down here!"

"He must allow to serenade the rabbits and the 'possums—give 'em a little music, perhaps," broke out another of the workmen with a bitter laugh.

Lee Renaud started to retort, then checked his words. These fellows had a right to feel bitter, with all their possessions swept away in that rolling ocean of muddy waters. It was an appalling disaster. A cloudburst up in the hills had flooded a whole valley. Trees, houses, dead animals rode the current in a procession of horror. And if help did not reach out soon to the pitiful families marooned on tiny islands, human bodies would be swirled off into that awful drift.

The need was great, yet there were so few to do the relief work, and the equipment of homemade scows and lumbering log rafts was so inadequate.

Sargon district was peculiarly isolated—fourteen miles from a railroad, not an automobile in the whole valley, no telegraph or telephone connections. Starvation, sickness from exposure, any of a hundred other ills could sweep in on the trail of the Sargon

flood before the outside world would be aware of it.

These facts stalked endlessly through Lee's mind as, with Lem Hicks to help him, he began unpacking his crates and sackcloth bundles in a tiny cabin on the edge of the flood. Here was wireless apparatus, a fearful jumble of it! This stuff might work—and then again it mightn't.

"Two strong huskies! Better be rowing a boat 'stead o' tinkering!" was a jeer that drifted in through the cabin door.

Maybe they ought to, and yet—with a sudden out-thrust of chin, Renaud settled back to work. Jeering be blowed! He must carry on as best he could.

Shades of all inventors! Lee Renaud had brought to Sargon Valley his old Marconi model, with a wild scheme for hitching a receiving circuit on to it. He had lugged down, also, his two crude little portables for field radio use, but they were too unperfected as yet to depend on for any distant use. And "distance" was what young Renaud had to get in an emergency like this.

Lem Hicks thought that in all these months he had learned a bit about wireless. But he was lost in trying to follow the complexities of

the improvised wiring plan Renaud was flinging into shape. Batteries, induction coils, couplers, transformers seemed to fairly spring into place. In his haste, Lee appeared to be rushing the work with incoherent carelessness, but in fact he was following a wiring plan of rigid exactitude, binding, twisting, tying wires with fingers that knew the meaning of every move.

Lem, unskilled as he was, could only fetch and carry.

"Lively now! Let's get at the aerial! Where's the hammer, the chisel?" Like one demented, Renaud drove himself and Lem Hicks, too.

Here was a bewildering tangle of coils and tubes hitched onto the little old-fashioned Marconi "brass pounder" of electric wireless telegraph.

Then at a touch from Lee the spark began to sputter. Adjustments, and it sputtered more.

"Now—now! It's hitting it up! And I'm going to CQ Mobile till the cows come home!" muttered Lee between set teeth. "That's the nearest big city and we got to have help out of 'em for down here—quick!"

To the crackle of the spark, the "urgent"

call sped over watery waste and land ridges towards civilization.

Every few seconds Lee eased up on his telegraphic tapping and switched over to listen. "Ah, we've touched a station!"

"WDK talking! Point Hope Amateur Relay. Who are you, brother? New station, eh? Glad you're on the air." On and on the string of Morse rolled in.

"Idiot!" snorted Lee in disgust, switching his key back to transmission with a vicious jab. "We've got to have action, not gab!" Then with steady spark he hammered relentlessly, "S.O.S.—S.O.S.—S.O.S.—Help! Help! Save!"

That brought Station WDK up to taw in a hurry, knocked the gab out of him, and held him keyed for business. "Shoot! Who's in trouble? We stand by to help!" flashed in the message.

Lee settled down to transmission. His code poured out in a steady stream from the brass pounder. "RL Amateur Station calling. Sargon River district flooded. Need immediate help. Cut off from everywhere—no railroads —no telegraph. Need food, tents, doctors. Pass on the call!"

On through the day Lee Renaud stuck to

his pounder, CQing up and down the whole state of Alabama, sending word of the dire need. Mobile, Anniston, Birmingham—the cities over the state were tapped into touch.

Yes. Help was coming. Red Cross was answering the S.O.S. of the lone operator down in the flood country. "O.K. for you, Flood Station RL. On the way with supplies, tents, doctors, couple more radios and relief operators. Army Post sending emergency airplanes. Coast steamer at Mobile wants to head up the Sound for rescue work. Can she make it?"

And so, hour after hour, Lee Renaud kept his old Marconi sparking—taking innumerable calls, sputtering back directions in Morse.

Then his little portable radios had their inning. Lem Hicks, with one of the field-pack mechanisms on his back, traveled the return trail till he was halfway between Sargon and King's Cove. From here he relayed the flood reports from Lee on to Jimmy Bobb at the Cove. This was done to ease the minds of the King's Cove folk who had plenty of kin all up and down Sargon Valley, and were anxious for news.

It was a blessed thing, though, that young Renaud had pounded his old Marconi on long-

distance calls for aid through the day, for the night hours brought a new and worse disaster. A great power dam, fifty miles up the Sargon, broke under the pressure of water, and by early morning a second flood rushed down and widened the first flood by miles.

CHAPTER X

A PENCIL LINE

Lee did not know just what had happened in that brief interval when he nodded at his post, but he awoke to find himself sprawled in the midst of radio wreckage on the floor of his cabin, which was reeling and rocking, adrift in the flood. Water swishing over his face had brought him around. It was coming in fast now, and the cabin was sinking. He would have to get out.

Something must have struck him when the flood swept off the cabin, for his head throbbed dizzily. Nevertheless he managed to climb to the rafters, dragging with him his little shoulder-pack radio though he feared the fall had ruined it. Hacking with his pocket-knife, he tore off enough shingles to let himself out on the roof.

All about him stretched a horrible yellow sea. On its drift were other flood-loosed buildings, tangle of house furnishings, swollen

dead animals, bellies up, and now and then a human corpse.

Like some frail skiff sucked into the wake of a great ocean liner, Lee's sodden little roof rolled smashingly against a big two-story cupolaed dwelling that was careening magnificently on its way to the Gulf of Mexico. The boy was catapulted into the air, then down into the flood, and came up, swimming for life. When the waves flung him against the big derelict again, he clung desperately to the ragged planking of what once must have been the porch, caught his breath, and began to draw himself up into this new haven of doubtful safety.

Heavy with weariness and the weight of water, it was a momentous matter to inch himself up the house wall to gain a high window sill and to crawl over. Half-fainting from exhaustion, he fell inside on the slippery floor.

A voice beat in his ears. It was startling to have words come out of that shadowy corner across the room.

"Hi, stranger! A perilous ride we're having!" Lying on the floor was a heavy-built man with iron-gray hair, and skin bronzed almost to mahogany. His face was drawn

with pain and one leg was stiffly bound in crude splints made of broken chair slats. "Captain Jan Bartlot, explorer, welcomes you to his home." A hand was extended as Lee crawled across the floor. "Devil of an exploration we're on now! Looks like our last one, though I've been in worse fixes and come out—once in Egypt, another time in Borneo."

Lee felt that this was some mysterious dream he was having. The flood, the drifting, this man with bronzed face and queer accent —all seemed part and parcel of the dream. It was too strange to be true.

But it was true. And this did look to be the last voyage in this life for the man and the boy unless rescue came to them. But how could they get help—how let people know of their perilous position?

His radio could do it! If only he could make it work.

Lee's whole body was a mass of weariness; his head was still dizzy. But as his senses cleared, he mechanically set to work to repair his little shoulder-pack radio. On the wave-rocked floor he spread out the parts. The heavy little cogwheels, the crankshaft, the coil of stout wire—these could be patched to-

gether. Lee rummaged through the derelict house for repair material. He smashed open the swollen doors of closets and cupboards and found glass jars, some tins, nails and pieces of wire. With these he went forward with his task. But it was hopeless! He could find nothing to replace the delicate network of minute wiring that had crossed the little selenized sheets in the transmitter and receiver. The blow that had torn this fragile meshwork away had destroyed all usefulness of the radio. There was nothing for Lee to do except wait and watch the flood wastes for some rescue boat.

Meantime he would try to keep the stranger with the broken leg as comfortable as possible on that dipping, careening house floor. It is remarkable how, in times of dire stress, two utter strangers can be drawn together. In a short time they are as old friends. Friendship made and cemented by danger! Lee Renaud and Captain Bartlot talked of many things.

One could almost forget present danger in listening to Captain Bartlot, mining explorer, tell of the weird, out-of-the-way places of the world where he had gone in search of the rare stones and minerals that were his hobbies. He

had prospected down in tropic jungles, where one had to dodge the poison darts of black head-hunters, where one encountered monster animals and reptiles. He had gone into the Arctic wastes, into the underground treasure-houses of buried cities, into the tombs of the ancients.

"If this ark of ours would only stop pitching so, why, boy, I'd show you some of the specimens I have in this case," Bartlot said, his hand touching a leather roll that lay beside him on the floor. "There's one of those rare green fire-diamonds from out of an Aztec king's tomb, and a piece of nickel-iron star stone from a meteor that fell in frozen Greenland. Rather far extremes, eh? A New York museum wants to buy my collection. I came back to my old home where I could catalog my specimens in peace and write up their histories for museum records. And after all my travels and close calls, here I am in my own living-room, my leg smashed by a cabinet sliding across the floor, and the whole house adrift on the flood tide of my native Alabama River."

The lurching of the drifting house ended the sentence in a groan, as the injured man, despite Lee's efforts, rolled across the floor.

"The water is coming in fast now," said Lee. "Do you think I could help you upstairs?"

With a bed slat for a crutch, Bartlot labored up the stairway, young Renaud lifting and tugging to the limit of his strength. Somehow they accomplished it though Bartlot fell unconscious when the last step was achieved. Diamonds in their leather roll and some useless radio junk had no particular value in a crisis like this. Nevertheless, Renaud returned to the first floor and carried these possessions, some tins of food, and a couple of soggy blankets up the slippery stair. Step by step, the hungry waters crept up and up behind him.

What would the end be? Would this sagging, sinking building last much longer? A booming detonation hurled a negative answer to the question.

A floating mass of logs and uprooted trees had crashed into a portion of the old house. Lower and lower in the flood tide rode the battered derelict. The water was coming up to the second floor.

There was still the cupola tower above the roof. If they could reach that! With a blanket knotted under the unconscious man's

arms, Lee began to drag him up the narrow, ladder-like stair that led into this turret. His heart was sick at the horrible jolting he had to inflict on the injured man. A blessing on his unconsciousness! It must hold him in its pall until—until—now they were up!

Lee carried their belongings up this second flight, and wedged the trapdoor down between them and that creeping flood below. Here was safety until the house battered to pieces in the torrent.

Jan Bartlot came out of his stupor and lay very still, clenching his teeth against groaning.

Death lurked near. To keep his mind off the boom and thunder of the flood, off the lap of water creeping, creeping up toward their last refuge, Lee Renaud bent over his wrecked radio. His fingers straightened a loop of aerial here, made a connection there, cranked at the motor shaft for power. It was all no use. Too much of the selenized plate wiring missing! But he had to be doing something.

Crouching in this last lift of floor space, he idly drew his pencil point back and forth across the tiny receiver plate, outlining the mesh of missing wires—and almost screamed

as a faint buzzing seemed to follow in the path of the pencil lines.

Extraordinary! Out of all reason! Electricity following a pencil line as though it were a wire!

A faint hope burned!

Like a madman, Lee cranked at the generator arm, adjusted transmitter and receiver, shot the buzzer.

And like a miracle sweeping over that yellow torrent, a sound came to him in the receiver:

"Renaud? That you? Been searching all night. First buzz signal just hit us. Where are you?"

"Stand by, Lem!" Renaud cranked frantically for more power. "Out in an old cupola top house—sinking fast. That double sugarloaf mountain peak looms just to the west of us."

"Airplanes searched there last night," wirelessed young Hicks. "Must a missed you. Coming again, two of 'em!"

But it wasn't an airplane that rescued them after all. To get an injured man out of a drifting house and aboard a ship of the air was beyond question. So Renaud stuck to his post till one of the rescue motor boats could

thread the flood litter and circle in near enough to get a hawser to the derelict. Supporting the half-conscious Bartlot on life-preservers that had been flung to him, Lee kept his burden afloat till both could be drawn aboard.

* * * * *

In that night, when Lee had been swept adrift, the Sargon Sound district had seemed to progress a hundred years. Yesterday it had been a land on foot or on mule-back, without telephone or telegraph. Today on a height above the flood, a city of tents had sprung up. Motor trucks, muddy to the wheel top, showed how transportation had been accomplished. Supplies in stacks, a long hospital tent, doctors, nurses, a flotilla of seaplanes moored in the crescent-shaped harbor! A line of refugees filing into a field soup kitchen, and more refugees coming into safety aboard a blunt-nosed steamer that had been scouring the islands!

Radio had done it! Radio had brought the assistance of a whole state to the relief of the flood sufferers down in this isolated district.

"Gosh!" Lee exclaimed as he stepped from the putt-putting little motor boat, "folks sure

answered the call of that old Marconi "brass pounder" in something like a—like a hurry!"

"Sho did!" Lem Hicks' voice was fervent. "And, boy, when you brought radio down here, you done something!"

CHAPTER XI

A MYSTERIOUS CALL

The winter following the Sargon Valley flood was a busy one for Lee Renaud. The spectacular success of his little "pencil line" radio outfit brought him considerable newspaper notice. He even had offers from one or two radio concerns for the outright purchase of his portable model.

But both his staunch friends, Dr. Pendexter and Captain Bartlot, advised against the sale of his rights in the little mechanism he had invented. It was in a crude state now but, developed and improved, it might have the makings of a fortune in it, especially if it could be advertised in a big way.

So Lee sent in an application to Washington to have his model patented, and then dropped back once more into the oblivion of King's Cove, and hard work.

The mysterious pencil line that had acted in the place of a wire connection, and so had

saved his and Bartlot's lives, had proved to Lee Renaud that there were many hitherto undreamed-of agencies for radio improvement. The boy longed to experiment in a big way with those crystal detectors that act as the electric ear of radio—such as zincite, and bornite, and silicon-antimony. But working with what materials he had, Lee improved his little machine until instead of a mere ten-or twenty-mile reach, he stretched its sending power to a hundred, then to two hundred miles.

Lee's vision grew. He dreamed of radio encircling the earth. Since his own little mechanism had stretched its call to reach on from twenty to two hundred miles, why couldn't it be improved to reach across frozen wastes of the far north, across jungles, across oceans? Oh, for a chance to study modern radio! A chance to live with one of those splendid, modern sending machines that concerns backed by huge wealth were producing! He had been going it so alone.

It was a blow to young Renaud when he found that Captain Bartlot was leaving the Gulf Coast, going north for an indefinite stay. Lee had come to depend greatly on the encouragement and advice of this tall, bronzed

man who, for all of his quiet look, had lived through more hairbreadth adventures than most folk even dream could happen.

It was to place his museum collection, which he had spent the better part of his life in gathering, that Captain Bartlot was going to New York. Before he sailed, though, as a parting gift to Lee Renaud, he laid in the young fellow's hand a bit of odd-looking stone in a tiny box.

"That doesn't look like much of a gift to a fellow who has stood by you on the 'burning deck,' or rather on the sinking housetop," he said with a laugh. "But if you happen to want to turn it into a bit of money for your experimenting, the Brant-Golden Jewelry Company over in Tilton would likely be interested in it."

Some weeks later, when a tall, dark-haired youngster, who had made the twenty-mile trip to Tilton on horseback, slid the tiny box with the bit of stone in it across the jeweler's counter, the Mr. Brant, of Brant-Golden, undid the wrappings rather diffidently, emptied the contents into his hand with a careless flip —then indulged in a shout and a sort of Indian-dance leap that jounced his pince-nez clear off his dignified nose.

"Why—er—ah! An ancient Egyptian balas-ruby, cut octahedronal!" He balanced it on his palm, turned it so that the facets caught the light, now pale rose, now deepening to orange. "Don't see one in a hundred years over here. Must be the stone Jan Bartlot was telling me about. Say, young man, I'll give you five hundred dollars for it!"

Lee Renaud opened his mouth—shut it. He was too surprised to say anything.

"Eight hundred, then, if it's real!" Mr. Brant mistook Lee's silence of pure surprise as negation of his first offer. Then, as if afraid the strange ruby might melt in his hand, the jeweler dashed into his testing room.

The balas-ruby was real, a semi-precious stone. It was the peculiar ancient Egyptian glyph, or inscription sign, cut into its back that gave the stone its triple value.

His head still reeling with amazement, Lee rode back to the Cove with a check in his pocket—the first eight hundred dollar check he had ever seen in his life.

He had not dreamed that Captain Bartlot was making him such a gift. The money was a wonderful boon. Not all of it went into radio experimentation, however. A part of

the sum re-roofed Great-uncle Gem's leaking old mansion. Another part went to Lee's mother back in the North Alabama city of Shelton. And there were still some funds left to invest in the costly experimental material young Renaud had longed for. He pushed on continually with his work of trying for distance, trying to amplify the weak sounds that traveled from far places on the mighty push of electrically generated waves that needed to be magnified and regenerated before the human ear could hear them.

Great-uncle Gem was wrapped up in Lee's work. Every experiment held his keenest interest.

"Gadzooks!" snorted the old gentleman. "This radio business has added ten years to my life. I was just drying up and aging for the lack of interest in something."

Night after night, old Gem sat before the radio Lee had built for him, keeping in touch with the world without moving out of his armchair.

"Eh, what's that now?" Gem Renaud waved his cane at a queer-looking metal tube Lee was bringing in from his workshop. This was a brass cylinder some ten inches long by two inches thick. Caps of a silvery metal

closed the ends, and a roll of fine wire was attached to each cap. In his other hand, Lee carried a compact wooden case.

"Just a new type storage cell and some selenium plates for aerial wave catchers that I want to try out on your radio."

Lee dropped down beside the mechanism and set to work. For an hour and more, he tapped and screwed and soldered.

"There, that's sort of like it!" He cut on the switch and leaned forward, tense, listening.

Clear as a bell, purer and with less static interference than ever before, music from a distant station rolled through the room.

"It's those selenium plates," jubilated young Renaud. "They catch the waves better than any other aerial going!"

Far into the night, he and old Gem sat tinkering, trying this station and that, enjoying themselves hugely. It was along toward midnight that they picked up a strange message out of the air.

"Renaud of the Radio, do you want to go to the Arctic?"

Just that; nothing more.

CHAPTER XII

THE NARDAK

As Lee Renaud, burdened with two heavy leather cases, stepped off the train in Adron, Ohio, and made his way toward the station exit, a big bronzed man rushed forward to meet him.

"Good for you, Lee!" and Captain Bartlot reached a hand for one of the cases. "You did what I was counting on—came in time to superintend the copying of that portable of yours for the field radio use. Say, want to go to the hotel first or straight out to the Nardak's hangar?"

"On to the Nardak!" said Lee. "I couldn't rest till I saw it, anyway."

Radio certainly was getting Renaud "somewhere." Like a magic jinnee of old, it had picked him up by the scruff of the neck, swished him out of a dreamy Gulf Coast village, and landed him in this hustling midwestern city that was famed for its rubber

factories and its airship hangar. If radio, to be exact, hadn't bodily brought him here to Adron, at least it had been the motive power that had gained for him this trip.

"Renaud of the Radio, do you want to go to the Arctic?"

That had been the beginning of it all. A puzzling communication, that, to drop in on a fellow out of mid-air. Later had come another message in explanation. Both were from his friend, Captain Jan Bartlot. He was planning a "mush" into the Arctic by airship, to prospect for gold and other valuables. He had sold his jewel collection for a vast sum, and now the call of adventure was taking him back into a life of exploration. Captain Jan was the type of man whom danger lures as a honey-pot lures bees. A great new gold rush was stirring the Western Hemisphere—a flying rush into Canada's frozen Arctic on the hunt for that precious metal. A fur-clad adventurer's discovery of gold-bearing rock in the northern wilds of the Mackenzie Delta had sent men trekking into that frozen land by canoe, by foot, by dog-sled. On his other explorations, Jan Bartlot had followed land trails and sea trails. But now he proposed to follow the

air trail up into the Arctic, to take a huge dirigible into that land of storms and snows. It was an expedition fraught with danger, yet one of marvelous practicability—if handled right. Instead of pushing north for many months on a long trek by canoe and sled, prospectors, geologists, mining engineers, mining-syndicate scouts, all the personnel of a vast mining operation could be transported into the north in record time.

For this mammoth gold hunt, the modern surveyor's implement was to be the camera, and the connecting link between the various scout parties was to be the "voice of radio."

On a dangerous journey like this, radio operators had to have something besides a nimble brain and mechanical ability; they must needs possess courage, stamina. It was remembrance of the way one Lee Renaud had stood by an injured man aboard a sinking, derelict roof in the Sargon flood that had caused Bartlot to offer the young fellow a chance to go on this wild, wonderful expedition.

In his long explanatory message sent to Renaud at King's Cove, Bartlot had stated that he wanted to try out the boy's portable radio model as a connecting link between

various mining explorations in the field of operation—was offering five thousand dollars for the right to copy this model and test it, provided Renaud went on the trip. A dangerous test he was offering the young inventor, but if it succeeded—well, it meant world advertising, and the Renaud Portable going over the top, big.

Would Renaud go?

The answer was Lee Renaud himself. After making the necessary arrangements for the care of his Great-uncle Gem, Lee had caught the first train north.

As they taxied across Adron, the busy rush of trucks and cars, the clang and clatter of this factory metropolis, and the loom of skyscrapers furnished a thrill for the visitor—but it was as nothing to the thrill of his first sight of a dirigible.

Captain Bartlot had wirelessed Renaud that an airship, the dirigible Nardak, was to be their mode of travel. But Renaud had not dreamed how immense this ship would be. Even before he saw the monster of the air, the unique building that housed it loomed before his eyes like some magic growth.

There it stood—a master structure in dun-colored steel, semi-paraboloid in shape, like

a mastodonic egg cut in half lengthwise. A one-story structure eleven hundred feet long, and tall enough to take a twenty-two story skyscraper under its roof, with room to spare!

While their taxi was still some miles from the airport, its enormous bulk dominated its surroundings.

Men in impressive uniforms patrolling outside the building seemed like minute toys in comparison. Small wonder, when the doors behind them weighed six hundred tons each and stood two hundred feet high.

As the two got out of the taxi and came up the paved way, Bartlot motioned to a couple of officials. "Commander Millard, Chief Engineer Goode," he called out, "here's another of our staff, second in command at the radio —my friend Renaud."

"Glad to meet you! Ah—a word with you, Captain?" and Millard, briefly acknowledging the introduction, went aside with Bartlot.

A heated argument ensued. Voices, lowered at first, rose now and then. "A mistake—too young, country bumpkin—risk to expedition."

Lee had the uncomfortable feeling that he was the subject of discussion.

Then Captain Bartlot came striding back, his jaw set, his bronzed face tinged an angry red.

At his command, a couple of stationary engines, housed on either side of the building, were set to generating. Under their power the huge curved doors began to roll back, each door moving on twenty steel wheels on a curved track that carried it back along the side of the building. As he stepped forward and took a view down that vast vault, Lee Renaud felt reduced to smallness—of a truth! As he looked upward, there was a sense of surrounding immensity that left him weak in the legs. Two hundred feet up, under the ridge of the roof, toy workmen labored on a duralumin framework that had been lifted up by cranes. Not a sound came from them, they were too far away.

Lee Renaud caught his breath. Within this mountain of steel and glass, six football games, a chariot race and a circus could be staged simultaneously.

"The largest building in the world without internal supports or columns of any kind," said Jan Bartlot, "and er-r, the only building in the world that has its own peculiar brand of weather. Ah—ca-chu-ah!" the Captain

ended in a wild sneeze as a heavy shower rained down upon them.

Lee looked about in puzzlement. The sun was shining brightly outside.

"Condensation," explained Bartlot. "All sorts of temperatures meet in here, form a fog, and occasionally roll down in rain."

"But the Nardak? I thought it was housed in here?" Lee cast his gaze over the vast emptiness.

"She's coming in now. Don't you hear the buzzer?"

"Bz-z-z!" A radio within the building had picked up the signal from the approaching ship. Men rushed forward from all sides and took their stands at stated intervals along the length of the building.

From the magazine illustrations he had seen of dirigibles, Lee Renaud pictured to himself how the Nardak would come—an elongated balloon drifting through the air, casting off thousand-foot lengths of rope for men to seize and drag her down to earth.

But the huge Nardak swept into her dock in a very different manner.

CHAPTER XIII

WITHIN THE SILVERY HULL

The Nardak was coming into her hangar—not drifting through the air, but rolling in on wheels. From far down the track line that entered the covered dock came a heavy rumbling. Then a long line of trucks appeared, running smoothly over the docking rails. Anchored to these was the vast, silvery shape of the Nardak, an aeronautical leviathan nearly eight hundred feet long by a hundred and forty feet high.

"The Nardak on wheels! I thought it was a ship of the air!" gasped Renaud.

"So it is," laughed Captain Bartlot, "but this is the simplest way of getting her into her hangar. Even with these rolling doors opened to make an enormous entrance, there is always the danger that the cross winds and gusts that sweep into the hangar will batter this lighter-than-air craft against the walls or roof. She's been on a test flight.

Her crew landed her out on the unobstructed field, then anchored her on wheels for the trip indoors."

After the Nardak was in the hangar, the ground crew stepped forward and fastened her ropes through the iron rings in concrete pillars that studded the floor here and there on either side of the docking rails.

"We won't have all this assistance and landing paraphernalia to help us when we get up into the ice country," said Bartlot. "But we are counting on another landing method that we are going to try out when the need comes. All right, young man," motioning Lee to follow, "want to see this 'cigar' of mine at close quarters?"

The huge dirigible in its sheen of silvery paint did look like a mammoth, tinfoil wrapped cigar—a cigar eight hundred feet long!

As Lee Renaud went up the little set of drop-steps and entered the hull, he was overwhelmed at the amazing intricacy of the interior. Seen from without, the simple lines of the dirigible would seem to indicate that it was nothing more than a great gas bag. But within that silvery casing was a structure as complicated as that of a steel skyscraper.

Three thousand metal struts criss-crossed in a maze of latticed girders.

"Tons, and thousands of tons of weight!" thought Lee. "How can this load even lift, much less fly!"

As if in answer to the thought, Bartlot spoke. "These struts—duralumin, an alloy metal, that's what they are made of. There, laid on the floor of the runway, is a discarded girder that's just been taken out. Lift it."

Lee took a long breath, got a grip on the thing, gave a great tug—and almost fell backwards. Sixteen feet of girder, and it weighed next to nothing! He could almost lift it with a finger!

"And yet the weight of six men couldn't bend it!" Bartlot remarked in answer to Lee's questioning look.

They passed on down the catwalk, or metal promenade plank that ran the whole length of the hull. On either side were arranged the great tanks of gasoline that furnished the motive power for the dirigible, and the twenty separate balloonets or gas bags that contained helium, which was the lifting power of the ship.

"Here's a case where *a la* the old rhyme, the cow will jump over the moon." Captain

Jan pointed to the gas bags. "These remarkable gas-tight containers are made of thousands upon thousands of portions of goldbeater's skin, which is the small tough section of the intestine of a steer. More than 1,500,000 cattle from the various stockyards contributed to the making of these helium bags—so in the name of science, the cow is going to soar pretty high."

One marvel after another aroused Lee Renaud's admiration as his capable guide took him from end to end of the ship, and down through the ladderways that connected with the outside gondolas that housed the engines, the navigating room, the quarters for the crew. There was the great rudder to guide her through the ocean of air, the flippers for elevation, the keel corridor for storage, the laboratory, the photographic room, the instruments for recording speed, height, weather.

Wonderful equipment, on a wonderful craft. Yet Lee Renaud found his eyes straying here and there, searching for something more.

"The radio-room, eh? I'll bet a ton of duralumin, you're on pins to set your eyes on it. Well, I've saved radio for the climax—

saved the best for the last, and I know that's a truth, so far as Lee Renaud's concerned." Captain Jan exploded into his big laugh as he led the way forward toward a compartment in the navigating section of the ship which was built at the bow, just under the nose. This navigating section was arranged with the control-room set first, the chart-house immediately behind, and behind this again the radio-room with its complete broadcasting and receiving equipment.

As Lee Renaud got his first eyeful of the Nardak's radio equipment, his breath seemed to cut off and his hair fairly stand on end for excitement. Here was radio—real radio!

Into wall panels, from floor to ceiling, were set elaborate mechanisms of grills and tubes and coils. In the center of the compartment was a desk and chair, as though this were some secretarial room in a skyscraper office building. But instead of housing pen and ink and paper, this desk housed the marvelous apparatus that could send word by air, instead of by ink.

A man in shirt sleeves, and with head phones adjusted, sat humped over the radio desk, working at a dial. This was Jack Simms, radio chief of the Nardak. As Cap-

tain Bartlot made the introductions, a ferocious scowl, emphasized by a great scar across the left cheek, seem to draw up Simms' face, and he spoke shortly, "Howdy, youngster!" with what appeared to Lee unnecessary emphasis on the "youngster." All these veterans seemed to have it in for the youngest member of the crew, and to resent his being thrust in among them.

While Simms rather perfunctorily explained to his newly arrived assistant the various parts of this very modern and powerful radio unit, Lee couldn't keep his eyes off the scar across the man's cheek. What Lee did not know, at that time, was that Simms had gained that perpetual decoration by sticking to his radio post aboard a rammed and sinking ocean liner—a post that he held till he had put wireless through to other ships that answered the call and rescued every man jack aboard the wreck.

"Now here are our ten-meter transmitters for exploring ultra-short waves," Simms' cool voice went on. "With condensers adjusted for maximum plate current, sounds from quite a respectable distance can be brought into the clear. I'll demonstrate." He turned the tiny marking light on the dial. "That

ought to get us Station ZEAF at Brinton, two hundred miles away."

As the dial light came to rest, a clear burst of beautiful music rolled through the little room.

"That's hitting it up pretty fine." Lee's face glowed. "I reached out to two hundred once with an old battery, some barbed wire and the like. Got the sound, but it was distorted, like the singer was yelling out of the side of his mouth—"

"You've made radio, huh? Receiver, or transmitter?"

"Both."

As Lee, at Simms' prompting, told something of the various experiments he had tried, Bartlot quietly left the room, to return later bearing the leather case containing the boy's portable model.

Without a word, the Captain opened back the leather and shoved the contents up under Jack Simms' nose. The latter half arose, then settled back, and went over the little mechanism carefully. He gave a long whistle. "Some points to that, kid!"

After that, there wasn't much in the way of radio that Jack Simms didn't go into minutely for Lee Renaud's benefit. Old Simms

had found that he and Lee talked the same language—audio frequency, voltage, detector grid input, C3, filter, and the rest of the jargon.

* * * * * * *

For a fortnight longer, the preparation aboard the Nardak went forward. On former trips the Nardak had been a floating pleasure palace circling the globe with a crew of forty and with twenty passengers in luxurious staterooms. In view of her impending arduous flight into the barren polar wastes, all of this was being changed. Such luxurious features of the ship as the cabin de luxe and the magnificent passenger saloon were being discarded, and small plain cabins installed. This was done to lighten the load on the ship and increase the capacity for the useful load of food and fuel necessities.

During this interim, on a special rush order, an Adron factory pushed forward the work of making six portables after Lee's little radio model. These were for field work on the Arctic barrens.

In the airship itself, several structural changes were made. There was the protecting of vital parts against the effects of low temperatures and the preparation of certain

special equipment for landing without any help from the ground.

Then the great day came. The day for all aboard, and then off, adventure bound!

For the last time the huge ship came out of her hangar on wheels. She was ready now to be loosed, ready to take the air. To the high daring of her mission the city of Adron did homage. Horns blared, great factory sirens roared their calls, bands played. Now a wedge of airplanes zoomed across the sky, come to bid the expedition farewell in their own particular aerial style. For this departing mammoth of the air was answering the greatest challenge of them all—a prolonged exploration flight over the vast frozen Arctic.

On this exploration were going a wonderful picked crew of scientists, geologists, meteorologists—learned men of many professions had striven for a chance to face any hardship, if only they might go on this expedition to the "geologist's paradise," the fearful, mysterious frozen Polar Region with its lure of unrevealed secrets.

Out of the hundreds of applicants, only so few could go—some sixty men. Because this dangerous expedition could be no stronger than its weakest member, its personnel had to

be selected with an eye to strength, health and disposition as well as scientific ability.

A large order in the way of exploration personnel! Yet Jan Bartlot's genius for leadership led him to pick an astonishingly capable, loyal, brave body of men to companion him into the wilds of the Arctic.

There was stocky, blond Norwegian Olaf Valchen who came from Spitzbergen, that far northern settlement. He had long been a lone flyer of the icy wastes, a carrier of dynamite and other mining supplies across the Hudson Bay territory.

"Tornado" Harrison of the United States Weather Bureau was going along to "get the weather" for the various undertakings.

A most important member of the crew was Sandy Sanderson, the cook. Sanderson was already well up on frigid zone cooking, having dished up seal steak patties and walrus goulash to whaling ships over half the oceans of the world.

On this flight, there were explorers who had already battled ice fields with various forms of polar locomotion, some with shaggy Siberian ponies, some with sledge huskies, some with ships of the sea. But now, by ship of the air, by radio, by electricity, Commander Bart-

lot hoped not only to penetrate the Arctic, but also to explore it.

He would have need of all the aids of modern science, for the Arctic world breeds the most fearful of storms, spews forth the most monstrous of grinding, treacherous icebergs, forever shifts its sky lights in a strange visibility that deceives and magnifies and lures with mirages.

As the great ship of adventure began to rise, the bands burst into martial tunes. Shouts roared from the throngs below. Handkerchiefs fluttered. A little girl in a red dress held her doll aloft for her father on board to see. Wives, mothers, sweethearts waved farewell.

Lee Renaud, looking over the side, felt suddenly engulfed in loneliness. In all that crowd there was not one to personally wish him God speed.

The last ropes were being cast off. The vessel rose higher.

There came a shout from below. A boy on a motorcycle was threading the crowd. "Telegram! Drop a hook!" was bawled up through a megaphone amplifier.

Then the little yellow envelope went fluttering up on the end of a line.

"Renaud,—Lee Renaud, it's for you!" Lee's hands trembled as he tore it open. What did it mean? What had happened?

From Great-uncle Gem! Lee's eyes devoured the line of words on the yellow sheet. "God bless you, and keep you, and help you to show to the world the stuff you're made out of, Lee Renaud. (Signed) G. Renaud."

Lee gulped. "G-gosh, I bet he sold a silver candlestick to get cash to send this!" The boy was humble and exultant at the same time. Somebody believed in him.

The ship was riding the air now. It rose majestically, like a gigantic silvery bird, turned its prow into the north and was off.

Before the Nardak stretched uncharted wastes—the ocean of air.

CHAPTER XIV

DANGER AHEAD

A new feeling permeated the ship. She was on her own now, headed for the great North. Only a few miles separated her from the city of Adron, but it might as well have been ten thousand leagues, so definitely was the voyage on.

After so much confusion of last visitors aboard, supplies being stored, a hundred things underfoot, the crew had to get down to the business of making affairs ship-shape. Some donned overalls, some stripped to the waist. Men moved swiftly along the catwalk, up and down connecting ladders.

Up in the keel corridors of the hull men were happily busy. Down in the navigating section men were happily busy. In the heat of the engine gondolas, slung four to each side of the hull, half-naked fellows, with sweat dripping down their bodies, tuned the six hundred horsepower gasoline motors for

power, and more power. Ninety, ninety-five, a hundred miles an hour—speed was coming up! They were on the way, hurrah!

This huge floating bubble of gas prisoned in fabric was to be men's home for many months. So the expedition settled down to making itself feel at home.

Bob Tucker, the expedition's photographer, and three assistants, set to work checking up on the complicated mechanism of the aerial cameras and the million feet of film that was to be aimed at the Arctic topography. Theirs would be the task of getting a picture record of the lay of the land in the mineral section, so as to help the geologists in their scientific deductions.

Up in the keel storage room, Arctic scouts went through the assortment of skis and snowshoes, preparatory to the foot-excursions in the land of snow. Slim up-curved sticks of the skis, broad, thong-latticed spread of the snowshoes—methods of snow-locomotion that have come down from man's dim, primitive past! These seemed incongruous aboard this modern sky ship. But Captain Jan Bartlot was combining the best of many ages in this exploration.

A little, short-haired dog walked sedately

out from the crew's quarters, navigated a ladder-like stair adroitly, and then curled up beside one of the big observation windows. This was Yiggy, Olaf Valchen's pet. Yiggy was an old-timer in the ways of the Arctic, having made many trips across the snow barrens with Valchen in his mining supply transport, a big-winged aeroplane. Out of some bits of fur, Olaf was already making Yiggy a new set of boots for polar walking—since Yiggy, being a temperate zone dog, had not been born with foot-pad protection like the shaggy canines of the land of snow and ice.

Here, there and everywhere over his craft went Captain Bartlot, seeing that all things were in proper shape. Before this start for the Arctic could be made, weary months of closest application to detail had already been spent by Barlot. Equipping an expedition was a huge business. There was the ship itself that had had to be refitted from stem to stern in preparation for bucking Arctic storm and the terrors of the "great cold." There had been waterproof cloth and fur and machinery and radios and tons of food to be bought. Where they were going, there was no grocery up the block to run to. There was no mecha-

nician's shop around the corner, either. So to make a ship of the air safe for getting them there and bringing them back, and safe for landing on frozen polar fields, one had to go prepared with hundreds of extra machine parts. One little missing screw could mean a calamity.

A captain must think of dessicated vegetables and canned sunshine for his crew's health. And just suppose they had forgotten to pack the snow moss! They hadn't. It was there in its container, along with reindeer skin boots and the down-lined gloves.

On even so slight a thing as a bundle of snow moss does the success of an Arctic trip hang. For without this specially prepared moss to line boots and absorb dampness, the feet of men tramping the blizzard-swept snow barrens would freeze.

Just such details as these, and a thousand others, great and small, had to be attended to by Captain Jan and the men who worked with him.

A trip into the frozen north was no holiday of leisure; it meant hard work for all concerned.

The busiest place aboard the Nardak was the radio-room, with its every space—walls,

ceiling, desk—crowded with modern equipment. Here was the powerful short-wave sending and receiving set, an intermediate wave set for communication with near-by cities and other ships of both air and sea, and a radio direction finder. Within this room, a group of mining scouts was carefully taking apart and putting back together one of the Renaud portables, under the watchful eye of Lee. These men must know their radio mechanism. For when the great dirigible dropped these men for scouting in various parts of the Arctic waste, radio would be their only means of communication with the rest of the party.

The staccato tap-tapping of radio telegraph seemed never to drop silent. Either Simms or Renaud was always at the desk instrument. As the string of Morse came in, they deciphered the code into plain English, and passed on the slips of paper to Tornado Harrison, weather-getter of the expedition. From Harrison's atmospheric deductions, the route of the ship was plotted. There was constant communication between radio-room, chart-room and navigating section.

This Morse code that tapped in so steadily was bringing reports from the United States

Weather Bureau at Washington. These reports were the chief aids in navigating the great dirigible.

The ocean of air is just as real as any ocean of water; it has its currents and tides and its air-falls, similar to waterfalls, where air pours from a higher to a lower level. It is the lay of the land below that causes the differences in the vast ocean of atmosphere. Mountains, forests, valleys, all produce their own peculiar currents and cross currents in the aerial expanse above. Over hills, the air currents are deflected upwards. Over great flat tablelands, the air flows downward over the edges in vast Niagaras of air.

Weatherman Harrison had his air map, America of the Air, all wavy lines and curves and whorls.

From observation posts, on land and sea, all over the world, weather news is continually radioed to the United States Weather Bureau. From this mass of information, the Bureau continually computes and makes deductions and predicts impending weather conditions—which it radios back out into the ether for the safety of ships of both sea and air.

Thus a far-flung outpost wirelesses: "Storm

sweeping southwest from Labrador at hundred and fifty miles an hour."

Knowing its intensity, its area, and its initial speed, weather chiefs can tell that the storm will reach Toronto in so many hours, and the Mississippi Valley in so many more hours. Storm warnings tap through the air, radio speeds the word in all directions. In consequence, a mail plane for the West dips south in its itinerary to avoid nasty weather; shipping on the Great Lakes goes into dock or heads for the safety of open water; a mammoth dirigible changes its course to circle around a hail-and-wind-tortured sector of the ocean of air.

Between his hours of standing watch at the radio, Lee turned with delighted eyes to the mosaic of rivers, cities, forests and farms spread beneath the ship. Radiograms, together with the great wall map, helped him identify the cities and the scenic wonders over which they passed.

They swept above Toledo and the smokestacks of Detroit. In splendid spectacle, the Great Lakes rippled their waters beneath them in the gleaming sun.

"Well, well, Lee," Captain Jan came down from the hull-storage section into the naviga-

tion car, bringing out for display one of the fur-lined sleeping bags and a snow knife, "how's traveling? What do you think of your first ride in a dirigible?"

"Fine!" said Lee. "Only I might as well be sitting out on the front porch back in King's Cove, so far as any motion can be felt. I can't tell I'm moving until I happen to look down and glimpse cities and lakes swishing by at considerably over a mile a minute."

"Um—yes, this thing rides a pretty even keel. Not much dipping and diving so far. And now take a look at these." Captain Jan spread out his armful. "No matter whether it may seem cumbersome or not, a sleeping bag and one of these snow knives for cutting a wind-break out of a drift, is what every man must carry if he goes off from the ship any way at all after we land in the ice country. It's a safety rule that I'm laying down."

"Er—yes, sir." Lee's answer was entirely absent-minded, his whole attention bent towards the radio instrument, as he leaned forward, listening to every click.

"Danger ahead—danger!" White to the lips, Renaud swiftly decoded the wild tap-tapping of wireless into understandable English. "Vast area of storms and tornado-

twisters sweeping down upon us, moving at immense speed!"

"Orders for engine-rooms, quick! Switch to the gondola telegraphs," roared Captain Bartlot. "Tap in orders, boy! Minutes may mean lives! Reverse flight! Turn the ship!"

Before a terror-twister of the skies, man can only flee down the wind.

CHAPTER XV

SHAGUN

Facing a storm, a vessel at sea would have reefed sails and laid low for the blow. But on this great elongated gas bag, there was nothing to reef. She could only turn tail and race the wind for her life.

Telegraph orders, rushed from control-room to engine quarters, brought the huge dirigible up short, rearing and plunging like a frightened steed. At touch of the engineers, the marvelous mechanism of drive-shaft and bevel gear tilted each propeller on its axis to throw the ship into reverse and back it around. For so huge a bulk, she wheeled in her tracks with amazing speed.

There was need of speed!

Even in that short time while receiving the wirelessed warning out of the air and plunging into retreat, great banks of cloud had reared themselves on the horizon, looming black and sinister. With every passing mo-

ment they rolled up, darker, heavier. With awful menace, a great droning roar filled the air.

The Nardak was turning back on the very fringes of an onrushing storm that seemed to leap out of the nowhere.

With a rumble the wind-clouds loosed their first furious gusts in a rage that tore the clouds themselves into a jagged pattern. Ragged openings gave vistas into the still more fearful storm that they had masked!

Through the barrage of thunderheads burst a three-headed tornado, three huge twisting wind-spouts that seemed to reach from earth to sky. Writhing, speeding, twisting across the sky, they pursued the Nardak like great devouring serpents. Devourers they were! Terrific wind velocity within those whirling storms could pluck the hair from the human head, could tear a man limb from limb, could wrench a great airship into shreds and splinters.

With a rush and a roar, forerunners of the storm seemed to burst upon the Nardak from all quarters, seemed bound to beat the great hulk into submission.

Gone was the smooth, swift gliding with which the Nardak had swept northward for

more than a thousand miles. In the fury of the gale, the huge ship of the air rocked and plunged. Everything not built in or lashed into place was flung crashing about the hull. Lee Renaud and Captain Jan were careened together and then dashed to the floor and flung hither and yon in a welter of broken furnishings.

"Is it the—the end? Will she capsize?" Lee managed to shout to Captain Jan.

"Heavy ballast—can't turn over. This pounding within, without, that's the danger." Even as Captain Jan spoke, came a thunderous crash of falling objects within the hull. "The struts—if they break, they'll slash the bags like knives!"

Like some hunted wild animal, the Nardak plunged on her way, riding the constantly changing air currents, sweeping on the edges of the storm, dodging between gales, by a miracle of maneuvering never letting herself be completely swallowed in the maw of the storm monster.

Behind her, three snaky wind-spouts came together with a concussion that rocked sky and earth. In the twinkling of an eye, the face of the land was changed. Trees, boulders, a whole cliff were swept upward and re-

duced to powder in the grinding crush of the winds. A great air wave, like some tidal wave of the sea, flung the huge Nardak high as though it were a bit of chaff, sucked it earthward to almost scrape the ground.

Then, as swiftly as it had roared into being, the tempest died away. The wind muttered and rumbled low, and dropped into a strange calm.

For a little space the airship hung in this calm, quivering and trembling like some spent runner that has barely survived a terrific race.

By degrees, the apathy of exhaustion passed from the crew. Battered and bruised, with strained, white faces, the men rallied from their terrifying experience and began to take up their tasks.

With apparent serenity, the Nardak went on her way. But in many and varied places, men labored to repair the damages of the storm. The thrashings of a broken strut had ripped the tough cloth-and-membrane lining of one gas bag. It was a total loss—a loss that reduced the lifting power of the dirigible, but did not cripple the ship to any appreciable extent. The builders had allowed an overplus of helium to meet such an emergency. Much

more alarming was the discovery of a defect in the propeller shaft and the flapping of wind-torn fabric on the port stabilizer fin.

Because Lee Renaud was cool-headed, as well as young and active, he took his part in the emergency repair work that now must be done.

There was no halting of the great dirigible on her flight. She simply went into reverse, pointed her nose to the northwest, and took up her storm-broken course once more. If possible, she must keep to her scheduled time of going into the Arctic. For the Arctic summer might last two months, and it might last only a week or so. Arctic summer means a slight melting of snow in wind-swept valleys, means black up-thrust of rock and cliff here and there where the snow-cap has slipped. It is in this brief period, the only time when the contour of the terrain of this ice-locked land is even slightly exposed, that geologist and scientist and gold prospector must make their swift search for the treasure held in Arctic rocks.

So without ever slowing down, much less landing, the Nardak held to her course, while men, like tiny midgets, crawled perilously over her hull, within and without. In the

crowded quarters of a motor gondola, mechanics repaired and replaced a propeller, all in the space of four hours. That was a hot and heavy task. But the real danger came to those workers suspended in a sort of harness against the outside of the great dirigible to repair its dismantled fin, while the giant ship held to her speed and to her height of a thousand meters in the air.

Young Renaud was one of those who let themselves be swung in a net of ropes between heaven and earth, while they plied great needles in the latest thing in "dressmaking," seamstering for a new garment for the stabilizer fin. The tattered condition of the fabric of the port fin was evidence of the suck and pull of the storm she had grazed. More than a third of it hung in shreds. Armed with a huge needle and a cord thread that billowed in the wind, Lee did his share of sewing blankets into place as patching material on the exposed framework. This would have to do till the dirigible made her landing at that last outpost of civilization, Shagun Post on Hudson Bay.

As the repair crew made its way up dizzy aerial ladders, back to the safety of the interior of the hull, and walked down the long

catwalk that led between rows of fuel tanks, Lee ran his hand through his upstanding black hair and laughingly remarked, "Whew! I'm hunting a mirror. Want to see how many gray hairs I got, swinging out there in that hundred-mile breeze. From the way my knees still tremble, bet it's all—"

"Ha-ooo! Ha-ooo! Ha-ooo!" A strange pitiful wail changed Lee's joking into an astonished gasp.

It was a wail that came up from the dim, lattice-work shadows of the ship's bottom, some sixty-odd feet below.

"Man overboard—I mean, lost in-board!" someone shouted.

"Must 've gone down from the walk here, in the plunge of the storm. A wonder he can still holler, after being hung down there all this time!" said Olof Valchen.

"Ropes!"

"Down the ladder there!"

"We're coming!"

A jumble of shouts echoed through all parts of the ship.

Lee was one of the first men to go swinging down a long narrow ladder into the shadowy interlacing of beams and girders. Above the catwalk were lights, but down here was semi-

darkness, and a maze of struts that must be threaded.

The thin wailing guided him. The gleam of his pocket flashlight glinted on a pair of eyes far below.

Then he was there, all the way to the ship's bottom, and touching his hands to a body wedged between girders. As Lee's hands made contact, he gasped at what he found. And Olaf Valchen, who was the next man to get there, echoed his gasp.

Then the two of them, sung out : "We've got the rope on! Haul away!"

What the men on the planking far above hauled up to safety and a place in the friendly glow of lights, was no man at all, but Yiggy, the little dog. A battered and banged-up Yiggy, but all there and very much alive, as the wagging of his stub of a tail indicated.

* * * * * * *

Wireless calls began coming in to the Nardak from the distant north. "What has happened? You are overdue here already!" These calls were from the radio operator at Shagun, the wilderness settlement that would be the dirigible's only halting place on its way to the Arctic.

A relay of supplies had been shipped

here, the end of both railroad and civilization. The Nardak was to take them aboard so as to enter upon the last lap of her journey as fully fueled and provisioned as possible.

Seven hours behind her schedule, the great silver Nardak drifted into the sky above Shagun.

The boom of guns and the lighting of a line of signal fires greeted her. These were to call together a landing-crew to lend their aid in bringing to earth the first dirigible ever seen in these parts.

For a time, the Nardak hung motionless, then by the use of movable planes and sliding weights, by which the center of gravity was shifted, she slowly began to nose down towards earth.

Waiting in a spreading, wedge-shaped formation were two long lines of nearly a hundred men. Not nearly so many were really needed. But every husky denizen of Shagun wanted to have a hand at manning the pull ropes of this monster visitor. Slowly the great ship of the air was drawn to earth in the vast clearing which Lomen Larsen, the Factor of the Shagun Post, had prepared ahead of time for the reception of the sky ship. Here, of course, was no cement landing field and iron-

ringed cement posts to receive mooring ropes, but the ground had been smoothed, and trees served as mooring posts.

As Lee stepped off the ship, he felt that he had stepped off into the Land of Contrasts. Here at Shagun ended the shining lines of steel rails over which traveled the mighty engines and loaded cars of the Great Northern. And here at Shagun began primitive transportation by birchbark canoe, shoulder-pack and dog-sled by which necessities were carried on into the North. Bearded white men, Indians, a few slant-eyed Eskimos with cotton garments of civilization donned incongruously atop their native furs, moved along the trails and in and out the low-roofed log shacks. And above these primitive folk loomed the high aerial and mighty masts of a modern powerful radio sending station!

But not for Lee Renaud, nor for anyone else of the expedition, was there much time to stand day-dreaming over the strangeness of the long arm of radio reaching out to touch this primitive settlement on the Arctic fringes. For it seemed the great Nardak landed in her open-air dock one minute, and the next the work of loading her new cargo and of further repairing began.

Men fell to with a vim. Men learned in geology and meteorology donned dungarees and entered upon a brand-new career of stevedoring. A perspiring aerial photographer and an equally perspiring slant-eyed Eskimo tugged a huge box to the hold opening. Indian trappers and the engineers of the latest thing in air engines labored together at the mountain of bales and barrels and tanks to be put aboard. A dozen times Yiggy escaped his quarters and rushed joyously underfoot to enter battle-royal with shaggy sled huskies that could swallow him at a mouthful—and a dozen times Yiggy had to be rescued from battle, murder and sudden death.

Muscles ached, but men joked and bantered and worked all the harder. Then at last it was all aboard—eight hundred pounds of oil, seven tons of gasoline, a thousand pounds of chocolate, pemmican, coffee and hard biscuit, which were to provision this great adventure.

Ground lines were loosed, the Nardak rose slowly. A clamorous ovation saluted her from the watchers. Shouts rose in four different languages, the bell of the little log mission clanged its farewell. Lomen Larsen touched off a row of powder-flares in a final uproarious salute.

Higher and higher rose the Nardak, then sped northward on her last great stretch of flight.

What would happen in this unexplored land? Only the future could answer.

CHAPTER XVI

QUEST FOR CAMP

Lee Renaud's black eyes looked out anxiously from the shaggy fur of his hooded parka or Eskimo coat as he climbed out on the top of the airship to see if ice had formed. Not a pleasant task, this, in a wind pressure created by a speed of over a hundred miles per hour, and with the thermometer at twenty below zero! Good, no ice sheathing as yet on the great shining hull. Coatings of ice and sleet were the danger to a dirigible—these could weight the ship down to a tragic fall.

Below the Nardak stretched snow fields, and often great frozen lakes where the ice lay sometimes smooth, sometimes thrust high in grotesque ridges where some throe of nature had hurled up the frozen substance. For days now they had been traversing the snow barrens, a strange white world where daylight held continuously. For this was the

land of the midnight sun. Through the summer of this weird Arctic world, there would be months of daylight, with the sun riding from horizon to horizon, but never quite dipping out of sight. With autumn would come a twilight that would merge into the long winter night when the sun left this frozen land to months of darkness.

In the present daylight period, the Nardak's men must make their exploration, then flee before the night, back to civilization and home.

Ordinarily, the great ship kept to a height of well over two thousand feet, but when the photographers wanted to picture some object, the dirigible would be glided down to a thousand, five hundred, even a mere three hundred feet above ground. Lee Renaud was startled to find that ice sheets which from on high had looked glassy smooth, from the near view stood out in deep ridges and furrows, as though broken by some giant's plowshare. Nature turned some strange tricks up here in this frozen North.

Everywhere was white stillness. Not a sign of vegetation; not a sign of animal life—or so it seemed at first. Those untrained in the ways of the Arctic do not at once realize

the protective coloring which Nature has bestowed on her denizens in this land of eternal cold.

To Lee Renaud, a wind-swept hillside over which the dirigible zoomed low, with moving-picture cameras clicking out film, was—well, was just a hillside dotted with black rocks where the gale had swept off the snow. Then—and Lee opened his eyes very wide—some of the black rocks began galloping off. In truth, these moving objects were a herd of shaggy musk-oxen that had been pawing for snow moss among the rocks till the shadow of the huge ship of the air had sent them snorting off in fear. In a white land, Nature had left these creatures dark colored, because they most often grazed on wind-swept highlands where their dun sides melted inconspicuously into the dark splotches of the landscape.

Another time, looking down through the observation window, Lee saw the amazing sight of a snow field that suddenly seemed to leap up into separate white parts and go bounding off across the plain. In this case it was a herd of white caribou that had been huddled at rest on the snow. Scent of danger, borne down on the wind, must have stam-

peded them. Soon enough young Renaud saw what that danger was, for another line of moving white swept into view—the wolf-pack, white killers of the North! Lee's heart shivered within him. These were so relentless; they knew only the law of fang and claw. Tails straight behind, noses down, the pack swept on down trail, were lost to view. But, ola, in the end the wolf-pack would pull down its prey; it always did!

In a snow valley, where mountain cliffs rose protectingly on either side, nestled a row of white domes. Circular hillocks with faint spirals of blue smoke drifting upward from a crevice in the top. Eskimo igloos—the round earth-and-stone huts banked in snow that were the homes of the fur-clad natives of the Arctic! As the huge ship of the air passed like a menacing shadow above this native settlement, fur-clad men crept out from their tunnel-like doors, waved their arms and raced wildly over the snow fields. Seen from the airship, they looked to be tiny ants swarming out of an ant hill. Then a flight of sharp-pointed arrows shot up toward the sky, curved back uselessly to earth. The huge ship drifted on serenely, safe in its heights from this puny demonstration.

"Must have thought we were some vast evil spirit, drifting up from Sermik-suak, Eskimo spirit-land!" said Valchen who had been much among the Arctic natives and knew their life and beliefs. "The sight of this great gas bag sweeping like a black shadow across their village was enough to strike terror to their hearts and set them on the defensive. On the whole, these Eskimo tribes are a kindly, hospitable lot. Let a man come among them in peace, and they'll take him in and give him the best they have. I've known them, in times of famine, to divide the last morsel of fish, the last chunk of blubber with some utter stranger."

Through the speeding miles, the white northland revealed itself to eyes that by degrees were learning to distinguish between the still white that meant snow wastes, and the moving white that meant some animal leaping into action on hoof or padded paw. On the ice of great lakes that were almost inland seas, now and again one glimpsed some shaggy mound of flesh and white fur that was a great polar bear, seeking his food through a break in the lake ice. In the air, the honk of geese, the weird laughter of the long-billed loons flying north in the continu-

ous daylight, often echoed the siren of the dirigible.

In the navigating-room, maps and charts were always in evidence now. Across their surfaces, lines drawn in day by day showed the progress of the ship. Its position was checked constantly both by magnetic compass and by sun compass. The ship's course was directed away from northwest and headed due north now.

"There it is—the tri-pointed crest of Coronation Mountain!" shouted Olaf Valchen, eye to the telescope and one arm wildly waving, beckoning the others to come and see for themselves.

In the distance, like a regal crown, showed the points of a group of mountains, rising above swirling clouds that masked all save the high-flung peaks themselves.

"It's somewhere near that range that we'll find Rottenstone Lake—Nakaluka, the Eskimos call it. And when we stand on its shores we'll be standing on wealth. There are rock mounds in this region where the stone is so old, it has cracked and lets the shining treasure veins show through. I know. I've seen it myself." Valchen's usually deep voice was high-pitched with excitement. He pulled

from beneath his fur overgarment a tiny map of caribou hide with some lines scrawled upon it. "The hunger fever was upon me when I drew this, some five years ago, but I am sure the lines are right. There's the tri-mountain; and the sun observations I took then tally with our present check-up, in part, anyway."

Below them stretched snow field and ice crag. Somewhere in that maze of peaks and ridges lay the frozen waters of Nakaluka and its encircling treasure mounds. In all this whiteness, its frozen waters would be no more noticeable than a tiny grain of dust would be on the expanse of a great plate glass show window.

The only feasible method of procedure seemed to be to get aerial photographs, piece together the long strips of film, and from a study of these get an idea of the lay of the land. This would take time. To cruise continually would burn the precious fuel and oil that must be more or less hoarded for the return trip. Better to establish a central camp for sleeping and eating, then to radiate out on air trips at regular intervals.

For a time the dirigible forged ahead, the eyes of all watchers searching the snow bar-

rens for a safe base camp. Below them a snow fog began creeping over the land, a mysterious curtain of blue and gray light. As they swept on in this strange haze, snow hills and valleys took on warped, unreal proportions. The official decision was that it was better to land now than to risk crashing into some shrouded peak.

At other landing fields there had been hundreds of men to pull at the drag ropes and gently ease the ship to earth. Here there was naught save snow and perhaps a polar bear or two—no very active assistance at landing in that!

Lee Renaud, like the rest of the crew, was full of anxiety as to how the new, and untried method Captain Jan was depending on would work. He hurried along the corridor to a trapdoor section where Bartlot and a number of his officers and men were grouped about a great flat metal plate that was connected to a windlass by hawsers passing over two sets of pulleys.

In the meantime, the dirigible, by motor power and the use of elevators, had been descending lower and lower, until it was now less than a hundred feet above the great ice field.

At a word of command from the Captain, the metal plate was let down through its opening in the ship. They heard when it struck the ice with a clank.

Along one of those pulley hawsers had been affixed a heavily insulated length of pliable electric wiring. Now, with hand that trembled a little as he began his great experiment, Captain Jan pushed an electric button that connected power from one of the ship's generators to this wire leading down to the plate resting on the ice far below. This plate was in reality an electric stove. As the current hit it, it was supposed by its heat to sink rapidly into the ice. Then when the electricity was cut off, it would freeze deep and fast into the ice—or so men hoped and prayed it would.

After a breath-taking interval, Captain Jan turned the windlass gently, to see if the plate-anchor held in the ice. More and more he wound on the turn shaft—and the anchor held! The experiment was working! A great shout went up from all sides. Many hands cranked at the windlass, taking in the lines, gradually forcing the ship down and down.

At last the pneumatic bumpers touched ice.

It was all hands out to see what manner of frozen world they had landed in.

Viewed from above, this surface had looked smooth enough, but now they found it to be far from a "looking-glass surface." There were up-ended ice cakes and pressure ridges to be clambered over. Of a certainty, water must be somewhere under this ice sheet. For water freezing, expanding, contracting, was what shot up the slabs of pressure ice. This was no pleasant place to dwell. There were whole stretches where the ice floor had split asunder in deep crevasses and purple chasms. Seeming snow hills were mere masks across gully traps.

For a night, or for the length of a period that would have been a night had the hazy red ball of the sun ever dropped entirely below the horizon, the expedition rested in this strange ice waste.

Then a party set out on foot to reconnoiter the land. Captain Jan, Valchen, a dozen others. Lee Renaud was glad his strong young legs gained him a place in this crew. Of necessity, each man had to bear a stout load. One could not venture out in the bare white wastes without food and weapons, a fur sleeping-bag to crawl into in case of a storm, and a

great knife for cutting snow blocks to build a wind-break. Also, the party carried bundles of bright, orange-hued flags to mark their trail.

Excitement hung over this little group as they made their start at trail-breaking into the unknown. Some on snowshoes, some on skis, they marched out under the strange glow of the Arctic sun, a glow that sometimes crisped and blistered, but never seemed to hold any cheer in its pale gleams that slanted over eternal ice.

After they had crossed miles of ice level and laboriously scaled frozen cliffs, they came down into a strange valley. On every side were snow mounds, like haycocks in assorted sizes, some the height of a man, some as tall as a one-story building. They were the roofs of round pits. Some pressure below had blown up these weird snow bubbles.

Bartlot, in the lead, stumbled against one. Its sides caved in and the Captain shot out of sight down in a snow hollow fifteen feet deep. Lines were flung down and soon he was drawn out, breathing hard and pretty well banged up, but luckily not seriously injured. After that, the party moved forward, roped together for protection.

Out of curiosity, they now and again slashed openings in the snow domes. Some covered pits fifty and a hundred feet wide, and vastly deep. It behooved them to pick their way carefully here, and to test each step with an Alpine staff thrust into the snow ahead. Behind the party, the orange gleam of the route flags marked a zig-zag trail and showed the way back to the base camp.

After threading this valley checkered with pitfalls, and climbing a range of ice hills all pitted and honeycombed by underground pressure, Bartlot's party halted on the crest of the ridge to gaze ahead in blank astonishment. A huge dark blot, a triangle in shape, loomed blackly against the white of a mountain of snow. It was as though some giant, passing up this valley, had painted his huge triangular flag on the smooth white, and had gone on his way.

To find the meaning of that mysterious black tri-cornered surface, they must push on to it. It could not be far, just across the valley and up the next height.

But "just across the valley" was a deceptive term. In the haze of the ever shifting Arctic lights, horizons are most uncanny things. Sometimes objects far away seem

almost under the nose. And again, men find their feet mounting some small rise that in the haze they had thought was far away. Mirages, too, fling processions of strange scenes before the eye. A mountain, a lake, a river looms vividly ahead, then fades back into the shadows from which it has sprung.

So it was a good ten hours of hard travel, and stumblings, and dodgings of ice pitfalls, before the exploration party came within "normal eyesight" view of the great black triangle.

Then they found that, instead of a black surface on the mountain side, it was a great black hole leading back and back into the mountain depths.

"A cave! A whale of a cave!" shouted Renaud who was taking his turn at leading, and had scrambled up the slope a rope-length ahead of the others.

It was a whale of a cave—one of those mammoth, finned and fluked creatures of the sea could have drifted in here and brought his whole family with him.

The snow domes and pits the party had just passed were as toys compared to this evidence of mighty pressure forces within the earth. Some terrifically violent cataclysm must have

flung up these two great walls of rock and ice that slanted together and formed a vast triangular tunnel.

At close view, it was a place of beauty. The depths that penetrated the mountain were dark. But here at the mighty three hundred foot entrance all was white. Crystal fringe of ice stalactites hung from the roof like huge prisms on a giant's candelabra. Snow banks, in soft mounds, guarded the opening. Now and again the stiff wind swept flurries from these drifts and scattered the white powder over the floor of the cavern in ever-changing patterns.

"A hangar for our dirigible! She could ease into here slicker than a banana into a peel!" shouted Captain Bartlot.

"Banana in a peel!" echoed Valchen. "Why, Captain, she could park in here and still leave room for an airplane to sail in rings around her! Whew! Some house we've found ourselves!"

"Think I'll do housekeeping over there, set up my portable stove and all." Sanderson indicated a side cave like a wing room off the main tunnel.

Electric torchlights were pulled from their packs and put into use. Excited laughter and

shouts echoed from the mighty roof and rumbled back through the cave, as they pushed slowly on, exploring wonders as they went. The ice drip on the cave walls had built itself into beautiful fantasies. Here stood a row of mighty columns like the pipes of a vast organ. Over there hung delicate ice lacework. Further on was a scalloped basin with a pillar rising out of it, icy semblance of a statue set in a fountain basin.

But even an ice wonder-hall set with frozen filigree could not turn their minds over long from the pangs of hunger. The journey had been one continuous round of labor and anxiety. The steep climb in the rarefied atmosphere told on strength and lungs. So before penetrating the depths of the cavern, the party decided to halt for food and rest. Back near the entrance, they dropped down, eased their heavy burdens to the snowy floor, and joyously opened up their packets of sandwiches and thermos bottles of steaming hot chocolate.

As they ate, this advance crew went ahead with their planning of how they could utilize the great tunnel to house the airship.

"We can drop the ice anchor out there on the slope," said Captain Jan between hearty

bites of a thick meat sandwich. "Then all hands can man the drag ropes and with a little help from the motor, we ought to be able to ease the Nardak into this ready-made hangar as pretty as you please."

"And some of the ice pillars will do for anchor posts to knot the ropes a—Hi, what's that?" The big fur-clad fellow who spoke cocked an eye upward.

Suddenly zooming almost over their heads, flapping its long wings and quavering its hoarse hooting call, a great white cliff-owl departed indignantly, his raucous voice hurling back protest to these invaders of his icy domain.

"Umph!" grunted Sanderson. "Looks like he's serving notice on us that this house is already taken. Don't you reckon we'd better step up the street to the real estate agent in the next block and see what he's got in the way of nice Arctic mansions and cottages to offer us."

Sanderson's gay banter choked off in a sputter, and a wild look came into his eyes.

A sound swept through the cave, the long-drawn, shivery "wha-o-o-o-ah!" of the wolf-pack trailing meat.

Another moment, and the killer pack surged

into view, speeding out of the depths of the cave itself.

The men screamed and leaped for the cavern walls, clambering madly up, clinging grimly to ice ledge and ice stalactite, praying that they would bear human weight.

CHAPTER XVII

BESIEGED

"Don't lose your grip, men! Better freeze to the walls than fall below there!" Captain Bartlot's voice echoed through the great ice cave.

Dwarfed to mere fly-size by the immensity of vast ice columns and ice-frescoed sides of the cavern, Bartlot's crew clung to the precarious ledges above the white-fanged wolf-pack that crouched waiting, waiting, below.

Sinister shapes, long-jawed, powerful, were those shaggy killers of the North. When they had burst, full cry, from the cave depths, a paralysis of fear had numbed the men's brains for an instant. Another instant and they had gone leaping, scrambling, screaming up the ice wall,—with never a thought for food or weapons, never a thought for aught save putting space between them and those slavering, slashing jaws.

Endurance gains the wolf-pack its meat—

relentless persistence in the chase and untiring watching and waiting for hunger, weakness and thirst to drop some beleaguered creature into their jaws.

Green eyes of hate glared up from the cave floor at the men trapped on the ice wall. Red tongues lolled hungrily over long jaws each time there was some faint movement of slipping or sliding, for it might presage a human losing grip and falling into the waiting death ring below.

One man did fall—Eric Borden, of the geological surveyors. The ice column against which his lank person was wedged broke and shot him, slipping and clawing, down the wall. The boom of the falling ice, Sanderson's knife hurled below, the flash of the two shots left in Bartlot's revolver—these created distraction enough to hurl back the wolves for a moment, while many hands reached down to rescue a comrade, to haul him back to the ledges.

Bartlot's shots had killed a wolf. The knife had drawn blood on another. Snarling and howling, the pack leaped upon its own unfortunates, tore them asunder, devoured them.

The men on the ice above shivered and dug deeper into crack and crevice.

Wedged precariously between two crystal

white stalactites on the wall, Lee Renaud trusted to the pressure of knee and foot to hold him firm, and thus leave his hands free. In spite of weariness, in spite of nerve rack from the hundred-eyed monster that waited below, Lee forced his fur-clad fingers on with their tinkering at a tiny radio set he carried on his back, a finished, polished copy of his own crude portable outfit. Factory experts had carried out his ideas in a more compact, lighter arrangement than he had been able to achieve with the rough materials available in his backwoods laboratory. But whether this new arrangement would send the call for help as effectively as that old rattletrap had done during the Sargon flood—well, that was something to be proved.

Lee's hands trembled as he pushed the wire framing of the folding aerial up and up over his head, while he crouched low to give room for it in the slanting niche in which his body was jammed.

It was dangerous work, balancing one's self in a high ice crack while below the killer horde squatted on its haunches and waited, as only the wolf-pack can wait, for its meat. A restless, fearsome, cruel-eyed horde it was. One unbalancing movement, and Lee Renaud's

body would go slithering down for the white-fanged horde to rend and tear into a thousand pieces, even as it had done to its own wounded members.

Shivers like an ague shot through his body, his hands were numbing from the bitter cold that inaction was letting creep through his double furs.

Hurry,—he must hurry! Soon he would have no more feeling, no more control. He and his companions would be dropping down like frozen lumps from this frozen wall—dropping to a terrible death.

Leaning forward precariously, Renaud slipped the head harness into place, adjusted receiver and mouthpiece, and threw his strength into cranking to generate power. His fingers, numb and clumsy within their great fur gloves, pressed the buzzer signal of the tiny radio and sent its staccato call hissing out through the air strata of the Arctic.

No answering buzz came back, no sign that his call had penetrated the ether.

"Bz-z-z-z!" went his frantic signaling. "Renaud calling!" he shouted into the tiny mouthpiece, as though to sweep his message on by the force of his voice alone. "Renaud calling! Party trapped by wolves at ice cave.

Follow trail of route flags. Help! Bring guns, flares. Help!"

Louder and louder grew his voice. But no heartening answer was flung back from the ship's radio. Not so much as a buzz or faintest whisper sounded in the receiver strapped to his straining ears.

No answer. Nothing.

The only sound was a long-drawn wail as the white horde circled in nearer, waiting, waiting beneath their prey.

CHAPTER XVIII

PROSPECTING

"Ah-boom-ah!" It sounded like guns, but it could be only the roar of some glacier avalanche, or an ice peak splitting asunder.

"Ah-boom-ah! Ah-boom!" There it came again, almost at hand.

Puffs of white smoke, fur-jacketed men running, dropping on knee to aim, to fire, leaping up to run on again. These were Goode, Millard, Harrison, and a score of armed men from the dirigible. At their onslaught, the wolf-pack leaped snarling into action, faced the hail of lead for a moment, then fled, leaving their dead behind. The snarling call and hunger wail of a pack cheated of its prey drifted back on the wind.

Numb and stiff in their frost-rimed furs, the cave refugees had to be lifted down from the ice ledges. Hot soup, and many hands to rub up circulation in numb forms soon brought them back to normal.

"How—how'd you ever find us so quick?" asked Renaud. "Radio wouldn't work—"

"Like thunder, it wouldn't!" ejaculated Tornado Harrison, whirling on his heel. "Why, your voice came sliding in on that ship's instrument like greased lightning. Simms tuned in to your voice soon as that buzz signal zipped in. He answered you a dozen times, telling you that help was coming. Didn't you get that?"

"Got nothing, not a sound, till those guns boomed. They were powerful welcome, though," Renaud grinned, then sobered down. "Something wrong with my instrument. Next time it might not work even one way. Got to look into that."

* * * * * * *

The next few days saw mighty changes at the ice cave. Instead of slinking wolves and flapping owls, it now housed a settlement of humankind. A very modern settlement it was. Man had brought electricity into the wastes of the Arctic,—electricity for heating, for cooking, for running various mechanical devices.

Before the explorers moved into this vast, ready-built, triangular abode, however, some precautionary steps were taken. No telling

whether bear as well as wolf had made this a den. Smoke bombs and gas rockets were hurled in to drive out any dangerous inmates. Then when the atmosphere cleared, thorough investigation was made by the light of electric torches. They found themselves in a mammoth shelter. A great opening back into the mountain that must have been full three city blocks deep by a block wide. So high was its pointed ceiling that our National Capitol and a couple of skyscrapers besides could have been housed beneath it.

With the motors running gently, and with men hauling at the drag ropes, the great silver hull of the Nardak was finally drawn into this Arctic cave-hangar. Ice columns served as anchor posts for its hawsers. The great dirigible held central place within the shelter. Here and there little rooms and tunnels rayed off from the main room. In one was set up a workshop with anvil and hammers and an electric furnace. In another a kitchen with pots and stove and part of the stores banked against the wall. Further on, Lee Renaud had spread some laboratory material, tubes, acids, wires. He was trailing the flaw in his radio receiver, experimenting with an acid dip for selenized plates, to render them im-

pervious to the terrific cold of this bleak white world. Since the wiring of his radio was in perfect order, and since the little machine worked well within a compartment heated to moderate warmth, Renaud was more than sure that the penetrating touch of the bitter Arctic must have interfered with his sensitized plates. With grim determination he pushed on with his work. He must find the flaw, must find the cure. Failure of these little portable connecting links could spell failure for the whole expedition.

When the expedition began to settle itself into the real business of this hazardous journey, seeking gold in this white, frozen land, Renaud watched his little "knapsack radios" being placed in the various field outfits with a clutch at his heart. Suppose the new acid-treated plates worked no better than the old ones? Suppose, in dire need, the radios failed, even as his had failed in part during the wolf episode!

Far different from anything that had ever heretofore been tried out, were Captain Jan Bartlot's very modern methods of gold seeking. For generations, the great Canadian Northwest has been luring men into its frozen heart to seek wealth. The magnet which drew

adventurers into this enormous wilderness, where for hundreds upon hundreds of miles there was no sign of human life, no vegetation save the fossilized leaves and twigs of a million years ago, no connection with the world of living men—the magnet which lured was mineral wealth. Gold, silver, nickel, platinum, not reckoned in millions of dollars, but in billions, lay almost to hand, just below the frozen crust of this frozen land. For hope of such treasures, men in the past pushed into the very fringes of the Arctic Circle by the primitive sledge drawn by wolf-dogs, and the equally primitive canoe of bark or skin. With such crude, laborious means of travel it took almost superhuman endurance to even reach the mineral fields of the Arctic. When the old-time mining prospector stepped off the train and aboard sled or canoe, it meant a whole summer of grueling, grinding travel before he reached the northern ore country. Then winter darkness would cover the land, and the prospector could do nothing but sit down and await the coming of another spring. The following year, when the red rim of the sun again showed above the Arctic world, he set about his prospecting, slow work that might lead him to wealth, but that would

likely take the whole of summer daylight in the doing. That meant another settling down for another lonely sojourn through the night of winter. The next spring the bearded, fur-clad prospector trekked his wealth back to civilization—if he lived to tell the tale of those terrible years of frozen exposure, hardship and suffering. Three years to trek a thousand miles and back! Hundreds followed the lure of gold up into the far north. Only tens lived to get back.

Olaf Valchen was one of those prospectors, who, eight years ago, followed the land trail and the water trail, by sled, by skin canoe, up into the frozen north. He had found gold—millions of dollars' worth of it in the strange rottenstone mounds that edged a frozen lake. Three years later he reached civilization, but as penniless as when he had adventured forth. On the long trail, when one has to either cast away life or gold—well, one drops the heavy skin sacks in the snow, and struggles on, thankful to survive.

And now he was going back to try to find again the trail that led to gold. But this time he was following the Arctic trail in a manner that was most modern of the modern.

In the past, one year by sled and portage!

Now, over the same trail by air in a few days! As the Bartlot expedition had by dirigible so speeded up the trek into the north, so it now planned to speed up the business of prospecting.

In this marvel of mine-prospecting by air, the camera was to be the surveyor's first instrument.

When the great dirigible backed out of its ice hangar and took the air once more, it wore a new appendage—a small, boat-like arrangement that swung by long hawsers far below the hull. In the nose of this and aimed toward earth were set three big motion-picture cameras. The major part of that million feet of film was about to be put into use.

As the huge ship of the air, day after day, radiated out from its cave base on journeys that covered hundreds of miles, the steady grind of cameras devouring film made aerial maps of the frozen hills, valleys, mountains, and lakes.

This was no film to be "canned" and carried to a warmer clime for development and display. To fulfill its purpose, it had to be developed right here in liquid baths of eight hundred gallons of water. A startling order for a land where water was not water at all,

but solid ice. So after the aerial cameras had clicked their final click, some rousing times were had at the ice cave camp. Captain, engineers, weather man, radio men, doctor, geologist, cook and crew, every man-jack of them turned out to lug snow, three tons of it! Cook pots were everywhere. Buckets and bags of snow were dumped in them to melt. In the end, tons of snow made hundreds of gallons of water—and the film had its developing bath, Arctic or no Arctic!

Outside on the snow barrens, the polar world went its old way. The cold streamers of the northern lights flickered in the sky; the wolf-pack flung its hunting howl on the winds; the great white bear stalked across his lonely domain.

But within the shelter of the ice tunnel, a handful of humans had dared to bring a new way of life into the Arctic wilds. Here a little audience sat thrilled and tense before a screen on which a moving-picture machine projected flight pictures made and developed in the very teeth of Arctic cold. Here was pictured no tawdry drama of human love and hate. Instead the film unrolled magnificent vistas of mountain land and lake land. Before the screen sat the expedition geologists,

exploring a thousand miles by paper in less time than the prospectors of other days took to explore only a few miles on foot, and with the pick and shovel. To a geologist, this pointed range of hills meant a certain rock formation. The lake bed presaged another. The long, low, rounded mounds circling water meant the great pre-Cambrian rock shield, the oldest stone formation in the north country, stone so old that its weathered seams have chipped and cracked and broken, so that the treasure it once hid now shows through in extrusions of gold or copper, silver or platinum.

With modern machines in that ice hangar, this little band of explorers could tap the air of the civilized latitudes and bring its music across thousands of miles of snow barrens. A turn of the dial in the ship's radio-room, and the long arm of radio reached forth and plucked music out of the air, the latest news from America's metropolitan cities, tunes from Broadway and personal messages from well-wishers.

"Shades of all ancient explorers!" Lee Renaud chuckled to himself. "How those old fellows would turn over in their graves at the idea of music from Broadway being just twenty seconds from the Arctic Circle. And

it all happened because a Pomeranian monk shut some electricity in a glass jar." As his mind went back to his own first studies of things electrical, Lee had the strange feeling that King's Cove and all his old life were in the realm of the unreal—that only the Arctic, and radio at the top of the world, and a modern airship flying the polar wastes were real.

When, from study of the aerial photographs, the geological map was finally pieced together and arranged, it was time for the ground prospecting to begin. The prospectors were carried out in pairs. The dirigible landed them in various places where the ground formation was such as to indicate the pre-Cambrian sheath rising in its long, shallow mounds. Some men were put down within a few miles of the cave base; some, hundreds of miles away. These intrepid ones were left with a pup tent, an eiderdown sleeping bag, a rifle and ammunition, radio outfit and food.

Left alone, the men were to make a temporary camp immediately and to begin prospecting. If they made a find, they were to communicate with the main base by radio, or by orange flags laid out on the white snow as signals for the dirigible when it passed over

again. In the prospecting crew were the best of their kind, miners from Africa, India and the Yukon.

The messages began rolling in incredibly soon. The ship's radio men had to dance continual attendance on buzzer signal and radio code. The first prospector to get in touch with dirigible headquarters was Olaf Valchen.

"Stand by—O. V. on the air! After breakfast, better hop over here in that sky boat. Location a hundred miles west of where longitude 110 cuts latitude 65. Come prepared to knock off a few samples of greenstone with a geologist's hammer, and fly back to base to have 'em assayed before supper. Come in a hurry! Got something real to show you! O. V. signing off!"

As the great dirigible, answering this joy call, sped through the snow haze and skimmed lower and lower, her lookouts sighted the orange signal laid out on the frozen white, and her engines were halted. The ice anchor was dropped and with a loud hissing seared its way to a secure depth. The hawsers were windlassed up, and the great hull eased to earth on its pneumatic bumpers. The entrances to gondolas and navigating section

were flung open—and the first fellow out was Yiggy, fur boots and all, barking a delighted greeting to his stocky blond Norwegian master. Scooping up the wriggling terrier into his arms, Olaf Valchen led the way to his find.

A hundred paces back from where he had laid out his flag signal, the prospector stopped on the banks of a frozen lake. Circling the lake was a rim of low mounds. One of these, like a domed ant hill, thirty feet high and some two hundred feet in diameter, had been partly freed of its frozen crust. These bare spots showed dull green and gray, the famous greenstone of the Canadian prospectors who had made lucky strikes. Nakaluka, the rottenstone of the Eskimos! So old was this, the oldest stone formation in the north country, that it was crumbling asunder, cracking apart in great seams. And in those seams lay gold, glittering and yellow.

Lee Renaud could feel his heart thumping against his double-furred shirt. He had not dreamed that his eyes would ever see such a thing—a great mound that was one vast heap of wealth, piled up in plain sight, set out where anyone strolling by in the course of the last thousand years might have seen it.

A few hours of work and they had col-

lected bagfuls of samples, so rich that the naked eye could almost estimate their value.

Excitement and happiness swirled through Lee Renaud. But it was not all "gold" excitement. His chief thrill was that his radio had passed a great test. Despite the creeping touch of abnormal cold on metal and acid and tube, his radio had brought in the message! His latest improvement had worked! Already still other plans were dimly outlining themselves, plans for stretching the power of his tiny instrument, making its call reach farther and farther.

Other reports were radioed in. Some prospectors had found other pre-Cambrian rock mounds, but with slight gold value, for ridges of granite rose too close and precluded the possibility of the ore veins stretching to any distance. Here and there, though, more of the vastly rich finds were located, mapped, stake-claimed, and sample ore taken.

On this one trip, gold worth millions of dollars could be taken out. And that was but the beginning. In the next few years, these Arctic Barren Lands would see civilization brought into them because of man's mastery of the flying ship, and his new power of

speeding the spoken word through the air on the waves of radio. For this forward march of civilization into the waste places, first bases of operation would have to be laid. Great dirigibles would transport the gas, food, equipment up into the North. Planes would be flown in. Hangars would be set up. Spare engines, spare parts, together with landing gears for summer or winter, all would be stored away. Gasoline and oil would be put down in large caches. Gradually a combination airport and mining camp would spring into being, with huts, radio mast, machine shops and the rest of the equipment.

Bartlot's expedition into the great northland had achieved success. And future success loomed ahead.

To Lee Renaud, it was all very wonderful and marvelous. Success written in large letters! And yet through it all, he felt a strange little throb of regret. This success had been too easy, too mechanical. He could not down an unwonted touch of sadness that soon there would be left no more surprises on this world of ours. No far, unknown, mysterious and frozen outposts for man to dream about. The White North conquered, and turned into factory ground!

But young Renaud was indulging too soon in boyish regrets over man's conquest of the great white mysteries of the north country.

The frozen North still held some surprises for puny man who had dared push his machines of sound and of flight into her vast lonely spaces.

The North reached her icy fingers after the huge silver Nardak loaded with Arctic treasure and headed southward; she roared out her power in merciless blasts that tossed and whirled the great ship like some chip at the base of a cataract.

CHAPTER XIX

IN THE GONDOLA

"Be a good sport, Scotty! Crank her up and give me a call in about three minutes. That's all the time I'll need to get up to the navigation-room." Lee Renaud, Ye Tireless Radio Hound, as his shipmates had laughingly dubbed him, pushed a batch of wireless outfit into the grasp of Scotty McGraw, assistant port-engine tender, with a plea for a little help in testing a new radio device.

Lee began backing out of the narrow confines of the engine gondola, but he never gained even the flimsy, swaying catwalk leading up into the hull. For, with a roar of fury, a sudden Arctic gale struck the ship. It seemed to leap up out of the nowhere to whirl and pound the huge envelope at every point. Like so much meal in a sack, Renaud was flung crashing back into the gondola.

From other parts of the dirigible came rendings and crashings. It was as though the

great ship were caught in a giant's hand and flung hither and yon. The Arctic had lain bland and tractable for a space, while man in his floating gas bubble had slipped into the frozen domain to rifle it of its stone-sheathed treasures. In suddenly awakened fury, the Arctic loosed its weapons of sub-zero, knife-edged gale, hail, sleet, and hurricane swirl that sucked and battered and tore.

On through the storm-darkened air, the dirigible plunged, swoop and check, swoop and check, now half capsized, now riding high, now riding low. Mountains fell away into blackness; the white land was left behind. They were over the frozen sea. All control of the ship was gone, all sense of direction lost. It might be a hundred miles, a thousand miles off its course.

Like a toy of the winds, the huge silver bubble was tossed high on the mad currents of the ocean of air. In some upper stratum, a rushing, swirling river of the winds caught the dirigible in its grasp and swept the lost ship back into the north faster than any of its human load had ever traveled before.

A hundred, two hundred, three hundred miles an hour—then the speed indicators broke!

Every part of the ship seemed out of touch with every other part. So far as any human connection was concerned, the engine gondolas, the hull, the fore-car might have been so many separate planets hurtling through space.

Lee Renaud, battered and banged almost to pulp, thought all feeling was gone from him forever. Yet in one awful flash, he sensed what was befalling them now. As though the river of air had reached the edge of some unseen, mighty precipice, and flowed over in a deadly, rushing torrent, the ship was sucked down and down over the invisible Niagara. Through a stratum of sleet it tore and gathered an ice sheathing of dangerous weight.

From an engine nacelle came a jerk of machinery striving to lift the great bag. Out of the hull rained tanks and stores, as frantic hands cast off ballast to try to save the ship. But it was impossible to halt the down plunge of the huge ship. In another moment, the Nardak scraped the ice of the polar sea, its port side grinding against the ice.

As the port gondola crashed, Renaud had a fleeting sense of being violently projected into space, then smashing heavily into the snow. Black mist swept through his brain, cleared.

He lay, a mass of aches. Then his eyelids flicked open. He tried to scream as he gazed upward.

The dirigible, freed of the weight of one engine cabin, had shot high in the air again!

In that moment, Renaud saw Harrison, the meteorologist, and Captain Bartlot standing at an observation opening and looking down in distress. Their eyes, wide with apprehension, seemed fixed on him until the huge balloon disappeared in the mist. From somewhere on high, a piece or two more of ballast crashed down and fell far out on the ice. A little later a thin streak of smoke showed up against the northern sky. Had the dirigible caught fire, or was this merely a smoke signal?

More terrible than the bitter cold creeping into Renaud's body was the desolation creeping into his heart.

CHAPTER XX

F-O-Y-N

Renaud lay where he had been flung, in a narrow trough of snow that was almost like a coffin. He scarce knew whether he was alive or dead. At first the bitter cold had pierced him sharply. Now his arms felt nerveless, like some leaden weights. All sense of touch seemed to have left his hands. He hardly knew whether they were still attached to his wrists or not.

Suppose he were dead? Suppose he were in his coffin? A pleasant stupor was creeping, creeping over him.

He was dying. He was freezing to death.

Through his stupefied brain a tiny thought kept hammering desperately. Rouse—move—stir! So the tiny impulse kept throbbing, but slower, and slower now. It was the impulse of life resisting death to the very end.

The storm gale had spent itself, but a tag end of wind fluttered across the wastes and

hurled snow with a sudden vicious sting into Renaud's face. Its cold slap roused the boy momentarily. He stirred. His circulation set up its throb again. Life was calling. Lee forced himself to a sitting posture. He must not give up. He must fight this temptation to abandon himself to this numbing, creeping cold. In slow movements, he freed himself of the drift snow, forced himself to stand, began to put one numb foot before the other in shaky progress across the ice sheet and its swathing of snow.

At last he reached the splintered debris of the engine cabin. Two men in the wreckage! Scotty was breathing. Lee could feel the faint movement when he laid his hands on the other's furred garment above the heart. Then Lee had his arms under Scotty's shoulders, shaking him, pounding him, begging him to rouse, to live. In urging another back into life, Renaud strengthened his own muscles, hardened his own resolution to fight.

It took long labor from both Scotty and Renaud to revive Van Granger, the other engineer. He had been stunned by a blow on the head. The left side of his face was all blackened and swollen from impact with the ice. Even after his two mates had lifted him,

walked him, rubbed up his circulation with desperate, vigorous strokes, he was too weak to do more than sit propped with his back to a snow mound near a tiny warming fire they had started with bits of the splintered wood from the cabin.

But they must have some kind of shelter against storm, sleet and cold. Here was plenty of material such as the Eskimos use for building their round-topped igloos. But Scotty and Lee knew well enough that their untrained hands held no knack for setting snow blocks into the perfect dome of an igloo. Any dome-shaped snow carpentry of theirs was likely to crash down on their heads at the first breath of wind. So they contented themselves with merely setting up straight thick walls of snow blocks. For roofing, they used material they salvaged from the wrecked gondola. Over their whole domicile, sides and top, they banked a warm blanket of snow, packed down hard and firm.

Every bit of food, broken machinery, pieces of wood and metal, were painstakingly gathered and stored within or close beside their shelter. It was a jumbled medley, remnants of broken radio, a case of chocolate, bursted cans of fruit, bundles of fur garments. Scat-

tered here and there in the wreckage were lumps of the rich specimen ore taken out of the Arctic surface mine. To men marooned on an ice sheet, gold was a mockery. Food, instead of gold, was treasure to them now.

Lee and Scotty worked on and on, gathering bits of wreckage, banking deeper their snow roof, pushing themselves to the point of exhaustion. For as long as they labored, they could force off thought. But finally they had to give in to physical weariness, had to drop down to rest. And all unbidden, thoughts marched blackly across their minds.

What could be the end? What hope could they have?

All they knew of the dirigible was that they had seen it still aloft, swept off in the gale. And then, later, that distant column of smoke. Had the silver hull of the Nardak gone up in flames? Or was that wavering smoke line a beacon, lighted by their shipmates where they had landed? And should the Nardak still be safe, and navigable, how would her searching crew ever find the castaways, three minute dots on the vast sheet of ice? For, clad in their grayish white furs, they were scarcely discernible against the white background of ice and snow.

Lee Renaud burrowed his head between his hands, as though by pressure he would stop the ugly round of thought. But thought swept on, ceaselessly.

To make matters worse, it was drift ice they were on, a great sheet that constantly changed its position. In a gale, it might be pounded into a thousand pieces and become little pans that would scarce support a man's weight.

Scotty, a short, heavy-set fellow, wearing spectacles that miraculously had not broken in his fall, worked continually with the remnant of his sun compass and a small magnetic compass. From position, checked by these, and by the loom of some far, white mountain peaks he hazarded a guess that they were in the drift somewhere to the west of Spitzbergen—and their nearest land would be the island of Foyn, an uninhabited speck in the polar sea, unvisited even by whalers, unless storm drove them there.

Spitzbergen—Foyn! Land that guarded the European gateway to the Pole! How mighty was the river of the winds! Caught in its currents, an exploration expedition had been hurled from the American Arctic, across the top of the world, to the polar regions above Europe.

"If the wind carries the drift aright," Scotty pointed to a distant white height, "we may come near Foyn Island and we may be able to make it to that piece of land by crossing from floe to floe."

"Foyn—land—uninhabited! This nearest land might be the South Pole, for what good it'll do us!" thought Lee Renaud bitterly. Why had he forced himself to live? Why hadn't he let himself go in that first quick, merciful stupor? What if they did ever reach that barren, ice-sheathed island? They might eke out their little store of food to last a few weeks. They might catch seals, shoot a bear—get food for a month, for a year. But in the end starvation, exposure, death must claim these forlorn castaways.

Need to work for another helped Renaud shake off some of the black hopelessness that enveloped him. Granger, who was ill, had to be warmed and fed, and made comfortable as far as was possible on this insecure haven of drifting ice. Cooking a scanty meal, melting snow for water, cutting a crude eye-shade out of wood to protect Granger's vision from the snow glare—just such homely tasks as these braced Lee Renaud and set him on his feet. Shame for the weakling thoughts in which he

had let himself indulge now swept over him. He was young, he had strength. He would keep his courage up. If he had to die—well, he would die. But he would go like a man, master of himself.

Determination and courage seemed to color the pitiless, white frozen waste with some glow of hope. The frozen drift felt solid to the feet, anyway. They were here, and they were alive. Might as well settle themselves in what comfort they could, and hold on to life as long as possible.

Out of the jumbled mass of wreckage, he and Scotty picked such things as might add to the comfort of their Arctic housekeeping.

"Well, here are knives and forks for our banquets." Scotty Mac held up some aluminum splinters gathered from around the crashed gondola. "With a little twisting and bending, we might convert 'em into fish hooks, if that'd be more to the point."

"And here's something we'll convert into a drinking glass for ice water. My, aren't we magnificent up here in the Arctic!" Renaud laughingly dug out a glass shade that had once adorned a light in the Nardak's lost cabin. "Cut glass and very chic! Bet when it made that pleasure trip around the world,

it never dreamed it would some day be turned upside down to hold drinking water for a trio of derelicts on an ice island! This felt, from under the engine base, might—might—" What he was going to do with the strip of felt, Lee Renaud failed to say. Something else caught his attention. "Why—why—" the boy gasped, then went to digging into a mass of chocolate and tinfoil wrapping. Something had buried itself down in the very midst of that great bundle of brown sweet.

Lee worked his hands into the mass, then lifted out some tubes, capped in a white metal.

"My radio accumulators!" he shouted. "Thought every fraction of the thing was smashed—but here's this much, anyway!" He carefully wiped them off, ran his hands over every part, shook them. The liquid within was safe.

The finding of those metal tubes wrought a vast change in Lee Renaud. His first thought, after regaining consciousness when he had crashed on the ice, had been to signal for help with radio. Then he had found his mechanism smashed, an utter wreck. That, most of all, had knocked the heart out of him. He had counted so on radio.

And now like a reprieve from the death

sentence had come the finding of these tubes, still intact. A couple of tubes,—little enough, but a start anyway.

"It's more than von Kleist had," Lee half whispered to himself. "And three hundred years ago von Kleist had the sense to take a bottle, a nail and some salt water, and figure out a way to get an electric spark. It's more than Hertz had, either, and he figured out a way to send electric power through the air, for a tiny distance anyway. I can at least rig up some wires and make a try at the thing."

It was a large order Lee Renaud was giving himself—to try to piece up a radio sending machine, the most delicate and powerful of all mechanisms, out of some smashed junk on an Arctic ice floe.

Not for nothing had Lee Renaud grown up with radio. Not for nothing had he followed the work of those old inventors making their way forward, a step at a time. In his own old workshop in the Cove, Lee had copied those steps in real, working mechanisms that, however crude they might have been, had yet achieved results. A modern, up-to-date inventor would be used to a splendid laboratory, used to purchasing smooth, finished, machine-made products to help with the carrying out

of his ideas. But Lee Renaud, like those old-time pioneers in electricity, was used to seizing upon wood and wire, scrap metal and glass.

It was this crude, hard-bought training that now gave young Renaud courage to face some scraps of broken metal and still to hope to build a radio here on drift ice.

Again and again Lee went through every vestige of the wreckage they had salvaged, laying aside such objects as might possibly be of use. Some long strips of metal, a heavy base that had once been an engine support—here was a start on the antennae. He wired the strips to the base, then wired them together at the top to insure stability. To his antennae, Lee fastened a strip of torn flag that he had found in the wreck. A bit of Old Glory fluttering above some Arctic refugees! Lee could not know how often in the near future their eyes would be fixed on that bit of cloth, their minds desperately wondering if the country behind that flag would not make some attempt to save them.

Working material was of the meagerest. Wires had to be soldered—but with what? For a whole period between "two sleeps" (there was not yet any set day and night in

this land of the midnight sun), Lee worked at two coins, a tin box, and a tiny fire of their precious wood splinters — and in the end achieved a rather creditable metal joining. The cut-glass shade, so very chic, now began a new duty as, combined with some tin, a wood stopper and a piece of wire, it served as a battery unit.

Lee Renaud hardly paused for eating or sleeping. Always his fingers were at it, adjusting wires, tubes, battery jars, wiring the parts. He would creep into his sleeping bag to rest, and in less than an hour, while the others were deep in slumber, out he would crawl, to take up his work again. A fever of labor burned within him. He could not lay this thing aside until he finished it, tested it, knew the best or the worst of the case.

For the hundredth time, Renaud looked up at the bit of flag floating on his Arctic aerial. The nation behind the Stars and Stripes would do something towards rescue if—if only America knew the fate of the greatest dirigible that had ever left its shores.

It was to combat that "if" that Renaud squatted beside the tangled mass of wires and jars and metal scraps which he prayed would act the part of a radio sender. Anyway, the

thing sparked! There was some power to it!

All in a tremble he raised his finger to tap the first code click over radio adrift in the Arctic. Foyn, the name of their nearest land, that was the first word to send.

"F-O-Y-N on the air, F-O-Y-N—" and that was all Renaud's radio clicked. For with a shout of anguish tearing up through his throat, he sprang to his feet, overturning the radio in a tangled mass of loosed wire and broken battery, and sped towards the ice edge.

Van Granger had been lying on a pallet of furs at the water's edge where he could entertain himself with trying for fish with a piece of twisted aluminum for a hook. Being still weak and sick, he had fallen asleep. In a lane of sea water, not twenty feet from the sick man, Lee had glimpsed a dark form gliding under the surface. In the next instant, thirty feet of sea monster rolled to the surface, all hideous saw-toothed black snout, and leaped high out of the water towards the ice edge.

CHAPTER XXI

KILLERS OF THE ARCTIC

"Help! Scotty! Killer whales!" screamed Lee, plunging forward, striving to pull pallet, sick man and all back from the edge of the ice.

At Lee's shout, the sea monster slid back into the depths. But not for long! There came a swish, a puff. Out of the water was thrust again the huge black snout, in which were set two wicked little eyes.

Other black snouts were thrust above water. Ten, maybe twenty killers rolled surfacewards and spouted.

Scotty was beside young Renaud now, helping him drag the sick man back and back from the water's edge. Their hearts throbbed painfully. It had been a close call. Another instant and the sea killer would have snatched off the helpless victim and sunk to the chill, dark depths to gorge itself on a meal of human meat.

"Hi, ya! Sea wolves! Tigers of the sea!" Such were the epithets Scotty hurled forth as he shook his fist at the sinister black crew that kept rising at the ice edge, sinking, rising again to glare with ravenous, evil eyes at meat that had moved out of reach.

Many times before this, Scotty had seen service in the Arctic waters, and knew well enough about the killer whales. Like the wolf-pack of the snow barrens, these ferocious sea creatures hunted in bands. The man shuddered now when he remembered what he had seen of the killers on the trail. Sometimes these carnivori swallowed dolphins alive without even taking trouble to kill them. Sometimes the killer-pack attacked a huge bowhead whale, beat him into submission with leapings and poundings of their lithe, cruel black bodies, devoured him ferociously, first the lips, then the tongue, then the rest of the monstrous, helpless body.

Anxiously the marooned men watched the horizon for thunderhead and storm cloud. Suppose a tempest rolled up, drove their ice field hither and yon on the sea, smashed and ground it to pieces? It would mean a terrible end, with the killer-pack of the sea nosing in, ready to devour.

It was hard to set the thoughts on anything else save the sinister sea shapes that slunk away mysteriously for long stretches, then rolled back into view, to glide and blow and watch with evil, hungry eyes.

Somehow, though, Lee forced his mind and his hands to concentrate on the scattered debris of his broken radio. For hours he labored, repairing the condenser, straightening springs, connecting wires. "F-O-Y-N"—that one call had gone out on the air from his machine. Had anyone heard it? Would he ever be able to send another?

An hour, eight hours, for days, the struggle went on. A black-haired boy out on the bleak white of drift ice striving to rehabilitate a dead radio! No tools, no resources, no anything save some broken wires and metal pieces—and the eternal ice!

A wire bent here, a patient bit of soldering there—then all of a sudden he was in touch! He had done it, made the connection, fired again the spark of electricity that was the life of radio!

Something was coming in! A chitter-chatter of faint telegraphic code!

"Latitude 78—on the ice—drifting—"

That was all.

No matter how Renaud sent out an answering call, begged, pleaded, tapped out the code, nothing more came in.

By the buzz from the wire circuit of his direction-finder, the call had come from the north. From the dirigible—it could be from no other!

For a brief second these two widely separated sections of the ill-fated expedition had been in touch. Then something had broken the connection. Atmospheric condition—disaster—storm, who could tell what? Never another sound came from the north.

Renaud and his companions comforted themselves with the belief that their shipmates aboard the dirigible had survived thus far.

Except for the briefest periods off for rest and food, and to race up and down the ice sheet to stir circulation against the treacherous creep of the bitter cold, Lee Renaud hung feverishly over his radio. It was their one hope, their one connecting link to anything beyond this frozen hell.

Two more days dragged by their torturous lengths, and except for its own little lonely click, the drift-ice radio brought no other sound. It seemed insane to continue to place

hope on this pile of junk. It had reached a little way into some near region—once—and that was all.

Scotty began to plan how they could strike out over the ice on foot, move on somewhere, anywhere, in hope of getting nearer to land. This inaction was terrible. But there was Van Granger to be thought of, sick and nearly helpless.

Sensing a discussion that he could not hear, Van Granger began begging his companions to kill him, to put him out of his misery. He wanted to be no drag, holding other men from their chance to make a dash for life. Without the burden of him, they could carry food—for a greater distance. After that, Lee and Scotty always kept their weapons with them, or hidden out on the ice. Words of comfort and assurance seemed to make no impression on the sick mind of their injured companion. They feared that he would do himself some bodily injury.

In the midst of black hopelessness, Lee aimlessly tinkered at the radio outfit. He shunted wires here and there, set a tube connection higher—and with a sudden crackle of spark, code began sliding in!

"V-I-A-T-K-A," Lee, counting code with one

hand, scratched the mysterious letters on the snow beside him. Exhilaration shot through him. He was in touch with something—but what, where?

"Viatka—Viatka!"

There it came again and other letters in a strange jumble that he could not seem to unravel. The direction-finder indicated south, east.

Frantically Lee poured his own code on the air. He got nothing more, made no other connection, could only content himself with the fact that his radio was reaching somewhere beside the floes of Arctic.

What Lee did not know was that, days ago, his first brief call, "F-O-Y-N," had been picked up by a young Russian amateur wireless operator by the name of Arloff, living in a village in the Government of Viatka. Just the faint, far signal of four mysterious letters! This call out of the ether intrigued Arloff. He wired it on to Moscow, from whence it was spread throughout the world.

Men began putting two and two together.

Foyn—an island at the gateway to the North Pole!

The dirigible Nardak lost above northern America after a great storm which had rolled

down thence—for days all radio communication cut off from the Nardak, and no more word from her. And now this mysterious call, "F-O-Y-N." Did that call hold the answer to the dark riddle of the lost ship?

The mental eye of the world focused upon that bit of frozen land in the polar ocean.

Though he knew nothing of this, though some atmospheric disturbance of the air ceiling interfered with his receiving, Lee Renaud continued to doggedly tap out his radio call of location—needs—a cry for help. In Siberia, Alaska, Canada, stations keyed by that mysterious "F-O-Y-N" checked in his message, tried to check their answering call across the frozen wastes—but some Arctic interference barred the sound.

Then came some sudden change in atmospheric conditions, storm-charged stratum of interference lifted, sound went through.

It was from the lofty wireless towers at Fort Churchill, an outpost of civilization on Hudson Bay, that an operator got the "touch" through to Renaud.

"Putting through to F-O-Y-N—clear the air, all else—courage to the marooned—help coming—the planes and ice-breakers of five nations to the rescue!"

"Rescue! Rescue!" shouted Lee Renaud, then his fingers fell to tapping again.

"Stand by—the Arctic on the air—F-O-Y-N heard the message—we live—" Lee Renaud slid to his knees, a prayer of thankfulness in his heart, then fainted dead away in the snow.

CHAPTER XXII

HOPE AND DESPAIR

"Tat! Tat! T-t-tat!" It was working, the radio code was coming in! They were in touch!

The wonder of it! From this lone camp out here on the drift ice, the operator with his patched-up radio set was in voice connection with lands hundreds—yes, thousands of miles away.

Some metal strips wired together, their bases banked in snow, lifted their slender height above this tiny camp on a drift-island of ice. Renaud's radio aerial!

Beneath it, a black-haired boy with determination in set of jaw, dark eyes fever-bright, hands that trembled from hunger weakness in spite of the grip a fellow kept upon himself! That was Renaud, huddled at patient work over screws and coils and some solder on a tin box. It took continual nursing to keep the metal patches and makeshifts in place, to keep

this thing clicking. But he was doing it! Taps —more taps! He was in touch again with that Hudson Bay operator at a station that was a whole ocean and half a continent away.

"Renaud—up about Foyn—are you on the air? Keep in touch with us. Your country is organizing search crews. Airplanes and ice-breaker ships from other nations joining the search. Give us news of the lost dirigible. Give us your needs."

Instead of being perched out on a hunk of ice in the vast Arctic, Lee Renaud, wireless operator, might, for all the precision of the affair, have been seated in a swivel-chair at the telegraph desk in some forty-story city skyscraper sending a message over the wires. He was on the ice—but the messages were going through in great shape.

"Stand by—Renaud on the air! No more word from the dirigible, save that call from the 78th latitude. Still clinging to hope for them. Our needs—everything. Something dry to stand on, medicine for our eyes, and food, FOOD!"

Lee shivered in his soggy furs. It was a marvel to be in touch even by sound. But a nearer touch must come soon, rescue. Their ice island was breaking in long black lanes.

Every hour now the encroaching water perilously ensmalled their domain.

Later that day the tapping in the radio box began again. The powerful arm of Canadian radio was reaching out with its vicarious comfort. It was a strange, homely message that traveled over the frozen wastes this time. It had started from somewhere down South. Hundreds of amateur radio operators of the monstrous, friendly Radio Relay Organization of America had kept the word going. A radio "ham" in Hillton, Alabama, had picked it out of the air and had wirelessed it on to Bington. A Bington amateur had put it on to Johnston. By devious, criss-cross routes, a crippled boy's little message had sped across the length of the United States, across part of Canada, and now had been flung on the air from that greatest of northern stations, the Hudson's Bay Aerial, to speed on waves of ether till that makeshift aerial near Foyn caught the words: "Lee Renaud, King's Cove is praying for you. Your true friend, Jimmy Bobb."

Lee Renaud had need of prayers—adrift as he was on breaking ice, with one companion injured and the other slowly falling a prey to ice-blindness.

Under the pound of the winds and the steady grind of the waves, their piece of ice was steadily diminishing. Where it had once stretched a limitless field, it now lay a mere thousand feet long by some seven hundred wide. Wet winds had turned its cover of snow into a slush two feet deep. Lee and Scotty were continually having to move Van Granger to new ridges to keep him above the slush.

Despite the crude eye-shades that they had whittled out of wood and tied above their brows, the awful ice glare had wrought havoc with Scotty's eyes, which were blue and seemed far more susceptible to the ice dazzle than did Renaud's dark eyes.

Twice now, ice breaks had further ensmalled their island. With terrific labor, they had moved their precious pieces of broken planking, their radio, their scanty stores, farther in to the tough heart of the floe. Scotty's eyes had gotten so bad by this time that he hadn't even seen a white bear, huge sneak-thief that had crossed from another floe, come creeping, creeping on its broad pads to dig into their pemmican cache. A quick shot from Renaud's rifle made the dangerous marauder take to water with lightning speed for

so lumbering a beast, and soon it disappeared in the maze of floating tablelands. Lee looked regretfully after so many hundred pounds of meat disappearing into the distance. They had need, dire need of that warming, rich bear steak and of the thick fur. A pity his hand had trembled so!

"T-t-tat, t-tat!"

Staccato stutter of radio coming in again! Oslo, Norway, sending the call.

"Courage! Relief operations pushing forward. The Russian boat, Kravassin, most powerful ice-breaker in the world, smashing her way up into the North towards Spitzbergen to act as base ship for the rescue planes. Dog-sledge camps being laid on mainland to act as further supply bases for rescue flight. Advance wedge of three great airplanes winging into the Arctic now."

Rescue on the way even now! And the metallic click of his tiny radio bringing the news to the human flotsam out on the drift ice!

"Rescue coming! Wonderful! And yet—" Like some black thread of cloud that spreads till it darkens a whole horizon, a cloud of premonition, of anxiety, spread over Lee Renaud's jubilation.

"Scotty," queried Lee, looking out over the limitless stretches of broken, drifting white, "how big is this sea we are in?"

"Um—let me see!" Scotty, unbelievably darkened by snow glare, black whiskers standing out fiercely round his emaciated face, kept his hand to his poor suffering eyes, and answered slowly. "Perhaps it's a thousand miles one way, by about fifteen hundred the other."

"Thousand—fifteen hundred!" gasped Renaud. "Why, Scotty, we're lost in a sea as big as the whole United States east of the Mississippi. And somewhere in that stretch of water are the pin points that are us! A silver dot further on, maybe, that's the Nardak! However—why, no lookout in a speeding airship can ever sight us! How can we hope?"

"Miracles. They still happen, sometimes," said the half-blind Scotty.

The next day, when Lee was trying to divide their remnant of provisions, a little chocolate and a little pemmican, into as small portions as would sustain life, so that it would last as long as possible, he heard a sound up in the sky. A zoom, far away yet coming nearer, nearer!

Scotty heard it too, and ran staggering blindly in circles in the snow, shouting.

A speck in the sky, coming close, closer—a great monoplane with orange fuselage and silver wing.

In a furor of relief and excitement, Renaud and Scotty shouted, waved, threw things in the air.

On it came from the south. The pilot must have seen them and was heading their way—no, no, he was passing too far to the left. He was missing them!

Like statues, the two on the drift ice stood rooted to their tracks. From within the cabin, Granger's weak voice called fretfully, wanting to know what the shouting was, what was happening?

Nothing—nothing was happening.

Ah, yes, it was! The ship of the air was coming back, coursing in the sky trails like some trusty hunter on the scent. Ola, it must locate them this time! Wasn't that the engine slowing, the pilot "cutting the gun" for a swoop to their floe?

But above, and still far away to the left of the three on the great white waste, the pilot in his silver and orange craft kept on his way, unseeing.

After him rose hoarse shouts, that the wind whipped to nothing before they could ever reach him. Somewhere below him, two humans flung up their arms and dropped in the snow. Hope had gone.

CHAPTER XXIII

FIGHTING THROUGH

Radio had brought ships of the air and ships of the sea into the Arctic to search for the lost crew from the great Nardak. Radio must now be the guide to focus the eyes of the searchers upon these dots that were freezing, starving humans on the boundless wastes.

Like one demented, Lee Renaud hung over his crude sending machine, tap-tapping his call into the air. He ate next to nothing, slept only in snatches. He must get in touch with Spitzbergen, with the base ship, the Kravassin, anchored there.

Since that first disappointment, two other planes had circled in and passed on, unseeing. These were two seaplanes, sturdy white-winged biplanes, with black fuselage. They had come that close, near enough for men on the ice to see, yet not to be seen. Frantic efforts to signal from the ice had been all in vain. One plane had hung in the air for an

hour's reconnaissance, then had disappeared in the grim Arctic horizon, flying back toward Spitzbergen.

"Put radios on the rescue planes. Put radios on the rescue planes, short-wave, telegraphic type. Sending station F-O-Y-N on the drift ice can then communicate direct and give signals to bring the planes to the refugees. S. O. S. to the world! Help! Relay the word to Spitzbergen. F-O-Y-N can't make the touch to its nearest station." Thus, hour after hour, Renaud sent his call.

For forty hours now, there had been no radio connection between the refugee camp and the rest of the world. Atmospheric disturbances, most likely,—a storm brewing and rolling up interference between the makeshift station and the stations of a listening world! The snow haze was creeping over the horizon, forerunner of evil weather. And out in the water lanes, dark forms rose now and again with a swish and a puff, rolled to blow, and sank again. Killer whales come back, like under-sea vultures, to await what storm and death might fling to them.

On and on went Renaud with his tapping. There was nothing else to do. Answer or no answer, his fingers kept doggedly to their

task. Tap—listen—tap—and the snow haze closing down.

Then through the dimness to the southwest, a puff of smoke rose slim and tall, and then spread out on the damp air in a long wavering line. Another smoke puff, closer this time! Smoke bombs! Signals dropped from a plane! With a sudden chitter-chatter that sent his heart pounding up into his very throat for joy, Renaud's little radio picked up a call out of the near air. The plane—it was sending the radio call! It was carrying a wireless set, as Renaud had pleaded!

With flying fingers, Renaud tapped out his location. "Here—to the east of the smoke bomb! More to the east! Now to the north!"

On came the plane. It was so easy now, with connection between ground and air. The plane was the splendid silver and orange monoplane that had searched in vain for them a day ago. Now it swept in a direct line above them, flew low over the ice pack—lower, lower, but did not land.

"Major Ravoia in the SD-55. No chance to land. Break of the ice would sink us all." It was a message that sent Renaud reeling across his machine.

But if the SD-55 could not land, something

else could. From over the edge of the plane, as it hovered low, an object was dropped. This fell free for a space, then fluttered open into a parachute to which was attached a large box. As gently as a hand setting a fragile glass on a table, the broad, inverted chalice of the parachute let its weight down and down till it eased against the ice.

Renaud had raised his head to watch. Now he went across the ice to the box with its draping of collapsed parachute. With a piece of metal he beat open the top—began lifting out the contents. It was enough to stir the heart of any half-starved marooner—food, clothing, snow glasses, bandages and medicines, rifles and ammunition and a collapsible rubber boat.

"Dry clothing! Something to eat! Medicine for your eyes!" he called out huskily to poor Scotty, who, scarce seeing at all now, came wavering across the snow slush.

The silver and orange of the monoplane was lifting above their heads now, but its wireless was pouring out a staccato message that came sliding briskly into the radio base on the drift ice: "Don't despair. The ice-breaker Kravassin is fighting through to you. By radio connection I can locate you again; can pilot the ice ship on."

With a zooming roar, the SD-55 was gone. So quickly did the flash of orange and silver disappear into the lowering haze, that it seemed almost a dream that it had ever hovered within hailing distance. Only, here was the food, the clothing, the strange rubber boat, the parachute that had eased them to the ice.

And on the air still seemed to hang the SD-55's message: "Don't despair—Kravassin fighting through!"

On the great Russian ice-breaker hung their last hope.

CHAPTER XXIV

ON TO GLORY

The little group huddled close on their piece of drift. In the past hour, winds had swept a huge tableland of frozen white so near that it had verged on riding down the castaways. But instead a veer of the wind had sent it scraping by, and shearing off the whole eastern edge of their domain. A few more such vast, unwelcome visitors and their island would be ground to bits.

Young Renaud, the only one of the three whom exposure had not crippled in some way, had hastily gathered together portions of their supplies in packs that could be strapped to each person. The queer rubber boat was ready for launching though it seemed beyond reason to hope that this frail craft could live for even a moment in that grinding, crashing, ice-strewn sea.

With a sudden hoarse cry, Lee Renaud leaped to his feet, seized the half-blind Scotty

by the shoulder. "Quick! Help me lift Granger to the boat! In it yourself! I'll stand ready to push off if—if what's coming strikes!"

Whatever the thing was, tornado or waterspout, a crash seemed imminent. Straight toward the piteous group on their drift island, the stormy line of white moved. Tons of ice were hurled up in great masses that crashed back to churn the sea in gigantic geyser spouts of turmoil.

Lee Renaud shivered and closed his eyes. It would soon be the end. God give him strength to meet that end like a man! Shoulders squared, head up, young Renaud stood beneath his wireless aerial with its fluttering bit of flag that was a little piece of America up here in the Farthest North.

Boom, crash, boom! It was a titanic sight, ice ripped and torn by terrific power.

Then behind the ice, through the ice, there came a strange sight. Not the tornado whirl Lee Renaud was expecting, but the great prow of a vessel. The most powerful ice-breaker of the North, the Kravassin, fighting through to the rescue!

Renaud's heart stood still. Relief at the reprieve from death itself rushed through him

in a revulsion of feeling that left him weak. His limbs were as water, his bones were as sand. He crumpled to his knees.

It was a stupendous spectacle that Renaud was given to watch—a gigantic battle between the vessel's ten thousand horsepower engines and the frozen clutch of the North.

How could the great ship smash through to the tiny island without sinking it?

In anguish, Renaud watched the oncoming, triple-sheathed ram of the Kravassin cut her terrible path.

The refugees would be submerged, swept off their ice. How could the monster heave in to them without drowning them?

But with a sure hand, Markovitch, captain of the mighty ice-breaker, sent his crashing, metal-clad monster in a great circle about the marooners' piece of floe. Then cutting in, he made a smaller circle, and a still smaller circle —eased his huge vessel close. Movement was slow. The great ram of the prow, instead of smashing, was nosing in, creeping in now.

With a shudder of steam exhaust, she came to rest, her bulk pushing together the ice drift before her to make a white bridge to the marooners' island. Over her side swarmed a rescue crew, Ravoia of the SD-55 leading on

foot now to the little ice island he had located from the air days ago. The castaways were rushed back, sped across rocking floe, lifted across little chasms that in another moment would be great chasms. At the ship itself, ladders and hawsers and scores of willing hands waited to draw them up to safety.

"Easy now! He's injured! That one's not seeing much. Easy, easy!" rose calls from the ice.

Blanket slings hoisted up Van Granger and Scotty.

Lee Renaud had the strength to go up and over by himself, though the feel of solid ship beneath him took the last of his fighting spirit out of him. Safe! He didn't have to be strong for himself and for the sick and injured men longer. He was going to make a fool of himself—going to faint. He fought off blackness in vain. He felt kind hands catch him, lower him. The last he heard was Ravoia calling out, "Hey, get this up—Renaud's wireless. It's made history, linked the world."

When Renaud came to, he had the feeling that he was still on a bit of drift ice, that it must all be a marvelous dream—the great ship, comforts, warmth, the crew calling him a hero.

With the picking up of these first refugees, the Kravassin's work had just begun. On into the frozen north she pushed, following that one clue of the lost dirigible, that faint wireless call Renaud's radio had picked up—"Adrift on ice. Latitude 78."

Life aboard the Kravassin was one steady round of excitement. Food and comforts soon brought Lee's strong young body back to normal. Snug in furs, from hooded parka to boot tip, he took his part in the work as the steel-clad ram bucked the floes, deeper and deeper into the frozen ocean of the Arctic.

Never was there such a ship as the Kravassin, never such a method of fighting the power of ice. With metal ram to crack the ice, with keel built to ride the floe in slide movement, with ten thousand horsepower engines to push her, the Kravassin fought her fight. Huge water tanks, fore and aft, were filled or emptied at the rate of hundreds of tons an hour, so the weight could be increased enormously to crush the ice or so the ship could roll to smash itself free.

For a week the Kravassin pushed on, path-making through the frozen pack, heading north, trailing the faint clue—"Lost at 78."

It was hopeless. The Arctic summer light

was merging into the twilight that meant the beginning of the long night of the Arctic winter. Man must flee before that long period of darkness descended. Part of the crew were ready to turn back. They had done their duty, had crossed 78,—no lost dirigible was in these parts. Perhaps it was all a hallucination of young Renaud's fevered mind—that radio call from the north. So the talk went.

They must push on, farther still; it was drift ice the call had come from; the dirigible may have been swept on and on. Renaud pleaded and begged for a longer search. He reinforced his pleading with promise of rich pay out of the golden treasure that had crashed with the gondola on the ice.

Because of Renaud's intense belief in that faint call, the mighty search went on yet a little longer. Steel prow crashing tons of ice to the sky and back—airship flotilla searching from the upper strata—men's eyes strained ahead for glint of lost silver hulk!

A second week was wearing itself away when lookouts sighted a thread of smoke on the north horizon.

A day later the Kravassin had fought through to that smoke.

CHAPTER XXV

FROM THE DESERT OF ICE

Small wonder that none had glimpsed the silver hull of the great Nardak! For on the desert of ice, when the search party from the Kravassin made landing, they found the whole crew of the lost dirigible—but no dirigible. Not at first, anyway. Instead before their eyes lay a vast mound of snow. Within those tons of white drift lay the wreck of the Nardak—two engines smashed, and no fuel to run those that were left.

Haggard, bearded men, in whom hope had long been dead, laughed and shouted and prayed when they saw the great ship, and the rescue party swarming over the ice.

"The impossible! A miracle out of the sky! How are we found?" gasped the worn, emaciated Captain Jan.

"The miracle? Wireless it was," Markovitch the Russian made answer in his halting, precise English. He whirled Renaud around

and thrust him forward. "And this youngster the miracle-man is. With some broken wire and bottles, he called to the world, and the world sent men to the rescue."

But miracles were not over, for the wreck of the Nardak was to go out of the Arctic under her own power.

Snow was shoveled off the huge hull. The Kravassin's machine shop had tools and furnaces and fusing power to rehabilitate the dirigible and put her back into the air again. Sufficient fuel was spared from the ship's tanks to get the Nardak to Spitzbergen, that strange Arctic island port where enormous gasoline tanks and lofty aerials of radio towers mark man's progress in the conquest of the ice country.

From Spitzbergen, the route lay on to Oslo, Norway, where further repairing and refueling were attended to. Then it was off across the North Atlantic, headed for the welcoming shores of America!

These adventurers into the mysterious North were bringing back wealth, and a knowledge of where lay Nakaluka, that Arctic lake edged with rock rich in golden gifts. Arctic gold had nearly cost them their lives, but it had led them to witness strange, wild

sights. Now that it was nearly over, Lee Renaud felt thankful for that wonderful experience—and living to get out again.

Behind them lay a great white land of a frozen world lit by weird lights, swept by winds of power—a mighty splendor that few humans ever see and live to tell of.

Before them lay Home!

Across the Atlantic in two days! Sighting the shores of America—passing above the great statue of the Goddess of Liberty, her arm lifted in silent greeting—then on over New York, and landing beyond the city!

Radio, the long arm of mysterious sound that had rescued the Nardak from the ice barrens—radio now welcomed her home. Since the time the Nardak had touched on the shores of civilized Europe, hour by hour, minute by minute, America had kept track of her return.

Bulletins had posted the shops and theaters of the land, "Nardak four hours away"—"Nardak sighted"—"Nardak coming in!"

Lee Renaud knew from the interest and enthusiasm of those radio calls that the home country was awaiting her wanderers—but for all that, he was taken back by the vast crowd that viewed their arrival. As far as the eye

could see, the flying field, the streets, the housetops were black with people. Bands were playing. A thunder of shouts greeted the dirigible as she settled on American soil once again.

Young Renaud was among the last to step down from the Nardak's open hatch. A hush fell as he came into sight, and a pathway opened before him. Then Captain Bartlot had him by the shoulder, pushing him forward, making him look up to where a triumphal arch loomed right ahead—an arch built of flowers, decked with the flags of the nations of the world and set with letters thirty inches high.

Lee Renaud's head swam dizzily as he looked up at those letters:

"Stand by—the Arctic on the air! Greeting to Renaud of the Radio! He linked the world with his wireless call!"

And America greeted her Renaud. Shouts roared up. People laughed and cried and hurrahed over a bewildered, dark-haired hero, who couldn't quite take it in that it was he they were shouting over.

Out of the throng, an imposing gentleman fought his way close, grasped Lee's hand and burst into hurried speech: "Represent the Amalgamated Radio Corporation of America

—have come a thousand miles to be first on the ground. Our corporation offers you a million dollars for the rights to your portable radio—"

"Sir, I'll talk later—please," and Lee pushed forward. Over there, could he believe his eyes? His mother, Great-uncle Gem pounding his cane and waving wildly, Jimmy Bobb in a chair—they had come all the way here, just to see him!